ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

SOLID WASTE DISPOSAL FACILITY PERMIT

PERMITTEE:	**Pine Hollow Inc.**
FACILITY NAME:	**Pine Hollow Inc. Landfill**
FACILITY LOCATION:	**Section 4, Township 16 North, and Range 30 east, on Brickyard Road (County Road 61), in Phenix City, Alabama comprising approximately 122 acres with approximately 102 acres designated for disposal.**
PERMIT NUMBER:	**57-07**
PERMIT TYPE:	**Construction/Demolition Landfill**
WASTE APPROVED FOR DISPOSAL:	**Non-putrescible and non-hazardous construction and demolition waste and rubbish as defined by ADEM Rule 335-13-1-.03., scrap tires, clean foundry sand to be used as cover material and fiberglass insulation debris waste (MELT) from IIG facility located in Phenix City, Alabama.**
MAXIMUM AVERAGE WASTE VOLUME:	**500 tons/day**
SERVICE AREA:	**Alabama counties of Chambers, Russell, Lee, Macon, and Barbour, and Georgia counties of Muscogee, Harris, Chattahoochee, Talbot, Meriwether, and Troup**

In accordance with and subject to the provisions of the SOLID WASTES AND RECYCLABLE MATERIALS MANAGEMENT ACT, ***as amended, Code of Alabama 1975, SS 22-27-1 to 22-27-27 ("SWRMMA"), the Alabama Environmental Management Act, as amended, Code of Alabama 1975, SS 22-22A-1 to 22-22A-15, and rules and regulations adopted thereunder, and subject further to the conditions set forth in this permit, the Permittee is hereby authorized to dispose of the above-described solid wastes at the above-described facility location.***

ISSUANCE DATE:	**March 27, 2006**
EFFECTIVE DATE:	**March 27, 2006**
MODIFICATION DATES:	**December 14, 2006, August 22, 2007 & ????????**
EXPIRATION DATE:	**March 26, 2011**

_____

Alabama Department of Environmental Management

Determination for Modification
Permit No. 57-07
Pine Hollow Inc. Landfill
RUSSELL COUNTY
March 30, 2009

Pine Hollow Inc. has applied for a major permit modification of its current Solid Waste Disposal Permit (Permit No. 57-07) for the Pine Hollow Inc. Landfill. The major modification of the permit involves increasing the total permitted area from approximately 52 acres to 122 acres and increasing the daily disposal volume from 250 tons to 500 tons. The waste stream for disposal at the Pine Hollow Inc. Landfill will remain non-putrescible and non-hazardous construction and demolition waste and rubbish as defined by ADEM Rule 335-13-1-.03., scrap tires, clean foundry sand to be used as cover material and fiberglass insulation debris waste (MELT) from IIG facility located in Phenix City, Alabama. The service area for the Pine Hollow Inc. Landfill shall remain the Alabama counties of Chambers, Russell, Lee, Macon, and Barbour and the Georgia counties of Muscogee, Harris, Chattahoochee, Talbot, Meriwether, and Troup.

Pine Hollow Inc. Landfill is located in Section 4, Township 16 North, and Range 30 east, on Brickyard Road (County Road 61), in Phenix City, Alabama. After the proposed major modification, Pine Hollow Inc. Landfill will comprise approximately 122 permitted acres with approximately 102 acres designated for disposal.

The Solid Waste Branch has determined that the permit modification application complies with the requirements of ADEM's Administrative Code Division 13 regulations for a municipal solid waste landfill.

Technical Contact:

Rao Malladi
Solid Waste Branch
Land Division

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
SOLID WASTE PERMIT

Permittee:	Pine Hollow Inc. 18 Old Brick Yard Rd. Phenix City, Alabama 36869
Landfill Name:	Pine Hollow Inc. Landfill
Landfill Location:	Brick Yard Road (county Road 61) approximately 1500 feet west of Hwy 165 Section 4, Township 16 North, Range 30 East in Russell County, Alabama
Permit Number:	57-07
Landfill Type:	Construction/Demolition

Pursuant to the Alabama Solid Wastes and Recyclable Materials Management Aat, Code of Alabama 1975, §§22-27-1, *et seq*. (the "Act"), as amended, and attendant regulations promulgated thereunder by the Alabama Department of Environmental Management (ADEM), this permit is issued Pine Hollow Inc. (hereinafter called the Permittee), to operate a solid waste disposal facility, known as the Pine Hollow Inc. Landfill.

The Permittee must comply with all terms and conditions of this permit. This permit consists of the conditions set forth herein (including those in any attachments), and the applicable regulations contained in 335-13-1 through 335-13-9 of the ADEM Administrative Code (hereinafter referred to as the "ADEM Admin. Code" or "335-13"). Rules cited are set forth in this document for the purpose of Permittee reference. Any rule that is cited incorrectly in this document does not constitute grounds for noncompliance on the part of the Permittee. Applicable ADEM Admin. Codes are those that are in effect on the date of issuance of this permit or any revisions approved after permit issuance.

This permit is based on the information submitted to ADEM on May 13, 2005, for permit renewal and known as the Permit Application (hereby incorporated by reference and hereinafter referred to as the Application). Any inaccuracies found in this information could lead to the termination or modification of this permit and potential enforcement action. The Permittee must inform ADEM of any deviation from or changes in the information in the Application that would affect the Permittee's ability to comply with the applicable ADEM Admin. Code or permit conditions.

This permit is effective as of **March 27, 2006, modified on December 14, 2006, August 22, 2007, and ?????????, and shall remain in effect until March 26, 2011 unless suspended or revoked.**

_____ _____

Alabama Department of Environmental Management Date Signed

SECTION I. STANDARD CONDITIONS.

A. Effect of Permit. The Permittee is allowed to dispose of nonhazardous solid waste in accordance with the conditions of this permit and 335-13. Issuance of this permit does not convey property rights of any sort or any exclusive privilege, nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of state or local laws or regulations. Except for actions brought under the Act, compliance with the conditions of this permit shall be deemed to be compliance with applicable requirements in effect as of the date of issuance of this permit and any future revisions.

B. Permit Actions. This permit may be suspended, revoked or modified for cause. The filing of a request for a permit modification or the notification of planned changes or anticipated noncompliance on the part of the Permittee, and the suspension or revocation does not stay the applicability or enforceability of any permit condition.

C. Severability. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

D. Definitions. For the purpose of this permit, terms used herein shall have the same meaning as those in 335-13, unless this permit specifically provides otherwise; where terms are not otherwise defined, the meaning associated with such terms shall be as defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

1. "EPA" for purposes of this permit means the United States Environmental Protection Agency.

2. "Permit Application" for the purposes of this permit, means all permit application forms, design plans, operational plans, closure plans, technical data, reports, specifications, plats, geological and hydrological reports, and other materials which are submitted to ADEM in pursuit of a solid waste disposal permit.

E. Duties and Requirements.

1. Duty to Comply. The Permittee must comply with all conditions of this permit except to the extent and for the duration such noncompliance is authorized by a variance granted by ADEM. Any permit noncompliance, other than noncompliance authorized by a variance, constitutes a violation of the Act, and is grounds for enforcement action, permit suspension, revocation, modification, and/or denial of a permit renewal application.

2. Duty to Reapply. If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit. The renewal application must be submitted to ADEM at least 180 days before this permit expires.

3. Permit Expiration. This permit and all conditions therein will remain in effect beyond the permit's expiration date if the Permittee has submitted a timely, complete application as required by Section I.E.2., and, through no fault of the Permittee, ADEM has not made a final decision regarding the renewal application.

4. Need to Halt or Reduce Activity Not A Defense. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the conditions of this permit.

5. Duty to Mitigate. In the event of noncompliance with this permit, the Permittee shall take all reasonable steps to minimize releases to the environment, and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.

6. Proper Operation and Maintenance. The Permittee shall at all times properly operate and maintain all facilities and systems of control (and related appurtenances) that are installed or used by the Permittee to achieve compliance with the conditions of this permit.

7. Duty to Provide Information. If requested, the Permittee shall furnish to ADEM, within a reasonable time, any information that ADEM may reasonably need to determine whether cause exists for denying, suspending, revoking, or modifying this permit, or to determine compliance with this permit. If requested, the Permittee shall also furnish ADEM with copies of records kept as a requirement of this permit.

8. Inspection and Entry. Upon presentation of credentials and other documents as may be required by law, the Permittee shall allow the employees of ADEM or their authorized representative to:

a. Enter at reasonable times the Permittee's premises where the regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit.

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit.

c. Inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit.

d. Sample or monitor, at reasonable times, any substances or parameters at any location for the purposes of assuring permit compliance or as otherwise authorized by the Acr.

9. Monitoring, Corrective Actions, and Records.

a. Samples and measurements taken for the purpose of monitoring or corrective action shall be representative of the monitored activity. The methods used to obtain representative samples to be analyzed must be the appropriate method from 335-13-4 or the methods as specified in the Application attached hereto and incorporated by reference. Laboratory methods must be those specified in Standard Methods for the Examination of Water and Wastewater (American Public Health Association, latest edition), Methods for Chemical Analysis of Water and Wastes (EPA-600/4-79-020), Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA Publication SW-846, latest edition), other appropriate EPA methods, or as specified in the Application. All field tests must be conducted using approved EPA test kits and procedures.

b. The Permittee shall retain records, at the location specified in Section I.I., of all monitoring, or corrective action information, including all calibration and maintenance records, copies of all reports and records required by this permit, and records of all data used to complete the application for this permit for a period of at least three years from the date of the sample, measurement, report or record or for periods elsewhere specified in this permit. These periods may be extended by the request of ADEM at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility.

c. Records of monitoring and corrective action information shall include.

i. The exact place, date, and time of sampling or measurement.

ii. The individual(s) and company who performed the sampling or measurements.

iii. The date(s) analyses were performed.

iv. The individual(s) and company who performed the analyses.

v. The analytical techniques or methods used.

vi. The results of such analyses.

d. The Permittee shall submit all monitoring and corrective action results at the interval specified elsewhere in this permit.

10. Reporting Planned Changes. The Permittee shall notify ADEM, in the form of a request for permit modification, at least 90 days prior to any change in the permitted service area, increase in the waste received, or change in the design or operating procedure as described in this permit, including any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

11. Transfer of Permit. This permit may be transferred to a new owner or operator. All requests for transfer of permits shall be in writing and shall be submitted on forms provided by ADEM. Before transferring ownership or operation of the facility during its operating life, the Permittee shall notify the new owner or operator in writing of the requirements of this permit.

12. Certification of Construction. The Permittee may not commence disposal of waste in any new cell or phase until the Permittee has submitted to ADEM, by certified mail or hand delivery, a letter signed by both the Permittee and a professional engineer stating that the facility has been constructed in compliance with the permit. ADEM must

inspect the constructed cells or phases before the owner or operator can commence waste disposal unless the Permittee is notified that ADEM will waive the inspection.

13. Compliance Schedules. Reports of compliance or noncompliance with or any progress reports on interim and final requirements contained in any compliance schedule required and approved by ADEM shall be submitted no later than 14 days following each schedule date.

14. Other Noncompliance. The Permittee shall report all instances of noncompliance with the permit at the time monitoring reports are submitted.

15. Other Information. If the Permittee becomes aware that information required by the Application was not submitted or was incorrect in the Application or in any report to ADEM, the Permittee shall promptly submit such facts or information. In addition, upon request, the Permittee shall furnish to ADEM, within a reasonable time, information related to compliance with the permit.

F. Design and Operation of Facility. The Permittee shall maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or nonsudden release of contaminants (including leachate and explosive gases) to air, soil, groundwater, or surface water, which could threaten human health or the environment.

G. Inspection Requirements.

1. The Permittee shall comply with all requirements of 335-13.

2. The Permittee shall conduct random inspections of incoming loads.

3. Records of all inspections shall be included in the operating record.

H. Recordkeeping and Reporting.

1. The Permittee shall maintain a written operating record at the location specified in Section I.I. The operating record shall include:

   a. Documentation of inspections and maintenance activities.

   b. Daily Volume reports.

   c. Personnel training documents and records.

   d. Explosive gas monitoring records.

   e. Copies of this Permit and the Application.

   f. Copies of all variances granted by ADEM, including copies of all approvals of special operating conditions.

   g. Groundwater monitoring reports if required

2. Quarterly Volume Report. Beginning with the effective date of this permit, the Permittee shall submit, within thirty (30) days after the end of each calendar quarter, a report summarizing the daily waste receipts for the previous (just ended) quarter. Copies of the quarterly reports shall be maintained in the operating record.

3. Monitoring and Corrective Action Reports. The Permittee shall submit reports on all monitoring and corrective activities conducted pursuant to the requirements of this permit. Groundwater monitoring is not required at this time, but if it is determined that monitoring is necessary, the Permittee shall conduct monitoring and submit reports as directed by ADEM. Likewise, if necessary, explosive gas monitoring must be conducted and reports submitted as directed by ADEM. Copies of the groundwater and explosive gas monitoring reports shall be maintained in the operating record.

4. Availability, Retention, and Disposition of Records.

   a. All records, including plans, required under this permit or Division 13 must be furnished upon request, and made available at reasonable times for inspection by any officer, employee, or representative of ADEM.

b. All records, including plans, required under this permit or Division 13 shall be retained by the Permittee for a period of at least three years. The retention period for all records is extended automatically during the course of any unresolved enforcement action regarding the facility, or as requested by ADEM.

c. A copy of records of waste disposal locations and quantities must be submitted to ADEM and local land authority upon closure of the facility.

I. Documents to be Maintained by the Permittee. The Permittee shall maintain, at the landfill the following documents and amendments, revisions and modifications to these documents until an engineer certifies closure.

1. Operating record.

2. Closure Plan.

J. Mailing Location. All reports, notifications, or other submissions which are required by this permit should be sent via signed mail (i.e. certified mail, express mail delivery service, etc.) or hand delivered to:

1. Mailing Address.
Chief, Solid Waste Branch, Land Division
Alabama Department of Environmental Management
P.O. Box 301463
Montgomery, AL 36130-1463

2. Physical Address.
Chief, Solid Waste Branch, Land Division
Alabama Department of Environmental Management
1400 Coliseum Blvd.
Montgomery, Alabama 36110-2059

K. Signatory Requirement. All applications, reports or information required by this permit, or otherwise submitted to ADEM, shall be signed and certified by the owner as follows:

1. If an individual, by the applicant.

2. If a city, county, or other municipality or governmental entity, by the ranking elected official, or by a duly authorized representative of that person.

3. If a corporation, organization, or other legal entity, by a principal executive officer, of at least the level of Vice President, or by a duly authorized representative of that person.

L. Confidential Information. The Permittee may claim information submitted as confidential if the information is protected under Code of Alabama 1975, §§22-39-18, as amended.

M. State Laws and Regulations. Nothing in this permit shall be construed to preclude the initiation of any legal action or to relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation.

SECTION II. GENERAL OPERATING CONDITIONS.

A. Operation of Facility. The Permittee shall operate and maintain the disposal facility consistent with the Application, this permit, and 335-13.

B. Open Burning. The Permittee shall not allow open burning without prior written approval from ADEM and other appropriate agencies. A burn request should be submitted in writing to ADEM outlining why that burn request should be granted. This request should include, but not be limited to, specifically what areas will be utilized, types of waste to be burned, the projected starting and completion dates for the project, and the projected days and hours of operation. The approval, if granted, shall be included in the operating record.

C. Prevention of Unauthorized Disposal. The Permittee shall follow the approved procedures for the detecting and preventing the disposal of free liquids, regulated hazardous waste, PCB's, and medical waste at the facility.

D. Unauthorized Discharge. The Permittee shall operate the disposal facility in such a manner that there will be no water pollution or unauthorized discharge. Any discharge from the disposal facility or practice thereof may require a National Pollutant Discharge Elimination System permit under the Alabama Water Pollution Control Act.

E. Industrial Waste Disposal. The Permittee is allowed to dispose approved industrial waste stream: fiberglass insulation debris waste (MELT) from IIG facility in Phenix City, Alabama after obtaining waste characterization certification and solid/hazardous determination from the Land Division. The Permittee shall not dispose any other industrial process waste at this landfill.

F. Boundary Markers. The Permittee shall ensure that the facility is identified with a sufficient number of permanent boundary markers that are at least visible from one marker to the next.

SECTION III. SPECIFIC REQUIREMENTS FOR C/D LANDFILLS.

A. Waste Identification and Management.

1. Subject to the terms of this permit, the Permittee may accept for disposal the nonhazardous solid wastes listed in III.B. Disposal of any other wastes is prohibited, except waste granted a temporary or one time waiver by the Director.

2. The total permitted area for the Pine Hollow Inc. Landfill is approximately 122 acres with approximately 102 acres designated for disposal.

3. The maximum average daily volume of waste disposed at the facility, as contained in the permit application shall not exceed 500 tons/day. Should the average daily volume exceed this value by 20% or 100 tons/day, whichever is less, for two (2) consecutive quarters the permittee shall be required to modify the permit in accordance with 335-13-5-.06(2)(a)5. An increase in maximum average daily volume shall not be approved by ADEM unless the permittee has received local approval for the increased maximum average daily volume. The average daily volume shall be computed as specified by 335-13-5-.06(2)(a)5.(i).

B. Waste Streams. The Permittee may accept for disposal Non-putrescible and non-hazardous construction and demolition waste and rubbish as defined by ADEM Rule 335-13-1-.03., scrap tires, clean foundry sand to be used as cover material and fiberglass insulation debris waste (MELT) from IIG facility located in Phenix City, Alabama

C. Service Area. The service area for this landfill, as contained in the permit application is Alabama counties of Chambers, Russell, Lee, Macon, and Barbour, and Georgia counties of Muscogee, Harris, Chattahoochee, Talbot, Meriwether, and Troup.

D. Waste Placement, Compaction, and Cover. All waste shall be confined to an area as small as possible and placed onto an appropriate slope not to exceed 4 to 1 (25%) or as approved by ADEM. All waste shall be spread in layers two feet or less in thickness and thoroughly compacted weekly with adequate landfill equipment prior to placing additional layers of waste or placing the weekly cover. A minimum of six inches of compacted earth or other alternative cover material approved by ADEM shall be added at the conclusion of each week's operation unless a variance is granted in Section VIII.

E. Security. The Permittee shall provide artificial and/or natural barriers, which prevent entry of unauthorized vehicular traffic to the facility.

F. All Weather Access Roads. The Permittee shall provide an all-weather access road to the dumping face that is wide enough to allow passage of collection vehicles.

G. Adverse Weather Disposal. The Permittee shall provide for disposal activities in adverse weather conditions.

H. Personnel. The Permittee shall maintain adequate personnel to ensure continued and smooth operation of the facility.

I. Environmental Monitoring and Treatment Structures. The Permittee shall provide protection and proper maintenance of environmental monitoring and treatment structures.

J. Vector Control. The Permittee shall provide for vector control as required by 335-13.

K. Bulk or Noncontainerized Liquid Waste. The Permittee shall not dispose of bulk or noncontainerized liquid waste, or containers capable of holding liquids, unless the conditions of 335-13-4-.23(1)(j) are met.

L. Empty Containers. Empty containers larger than 10 gallons in size must be rendered unsuitable for holding liquids prior to disposal in the landfill unless otherwise approved by ADEM.

M. Other Requirements. ADEM may enhance or reduce any requirements for operating and maintaining the landfill as deemed necessary by the Land Division.

N. Other Permits. The Permittee shall operate the landfill according to this and any other applicable permits.

O. Scavenging and Salvaging Operations. The Permittee shall prevent scavenging and salvaging operations, except as part of a controlled recycling effort. Any recycling operation must be in accordance with plans submitted and approved by ADEM.

P. Signs. If the landfill is available to the public or commercial haulers, the Permittee shall provide a sign outlining instructions for use of the site. The sign shall be posted and have the information required by 335-13-4-.23(1)(f).

Q. Litter Control. The Permittee shall control litter.

R. Fire Control. The Permittee shall provide fire control measures.

SECTION IV. GROUNDWATER MONITORING REQUIREMENTS.

Groundwater monitoring is not required at this landfill provided that the waste stream is in accordance with Section III.B. Should any waste be disposed other than the waste streams indicated in Section III.B., ADEM may require that groundwater-monitoring wells be installed.

SECTION V. GAS MONITORING REQUIREMENTS.

A. The permittee shall design, construct, and operate the facility so as to control and monitor the generation and emission of explosive gases (such as methane), and so as to prevent said gases from collecting in, or around structures at concentrations exceeding the limits imposed by this permit.

B. Systems and Equipment. The Permittee shall provide, install, and maintain gas monitoring and/or recovery systems and equipment.

C. Concentration Limits. The Permittee shall prevent explosive gases from exceeding:

1. The lower explosive limit at the facility boundary.

2. Twenty-five percent (25%) of the lower explosive limit in any facility structure other than those that are components of the gas control and/or recovery system.

D. Gas Monitoring Program.

1. The Permittee shall monitor explosive gases at the facility. The gas monitoring program shall monitor explosive gas concentrations in the atmosphere, in the soil, and inside all structures at the facility, including but not limited to buildings, under bridges, and any other location which is conducive to gas accumulation. Gas monitoring data shall be included in the operating record and be made available to ADEM during inspections and at other times upon request.

2. The Permittee shall conduct the gas monitoring at least once in each calendar year. The Permittee shall submit a report to ADEM within thirty (30) days after each monitoring event documenting the levels of explosive gases measured at the facility.

3. In the event that explosive gas levels exceed, at any time, the limits specified in this permit, the Permittee shall:

a. Immediately take all necessary steps to ensure immediate protection of human health and property.

b. Immediately notify ADEM of the explosive gas levels detected and the immediate steps taken to protect human health and property.

c. Within twenty (20) days, submit to ADEM for approval a remedial plan for the explosive gas releases. This plan shall describe the nature and extent of the problem and the proposed remedy. The plan shall be implemented upon approval by ADEM, but within sixty (60) days of detection. Within the sixty (60) days the plan shall be placed in the operating record of the facility and ADEM notified that the plan has been implemented.

4. Monitoring points for the measurement of explosive gas concentrations in the soil and/or atmosphere shall be located along the landfill boundaries and shall be spaced no more than 300 feet apart. In areas where the landfill boundary is within 1000 feet of a structure, the monitoring points shall be not more than 100 feet apart.

SECTION VI. SURFACE WATER MANAGEMENT.

The Permittee shall construct and maintain run-on and run-off control structures to control the discharge of pollutants in stormwater. Any discharges from drainage control structures shall be permitted through a discharge permit issued by the ADEM Water Division.

SECTION VII. CLOSURE AND POST-CLOSURE REQUIREMENTS.

The Permittee shall close the landfill and perform post-closure care of the landfill in accordance with 335-13.

A. Final Cover. The Permittee shall grade final soil cover such that surface water does not pond over the permitted area as specified in the Application. The final cover system shall comply with 335-13.

B. Vegetative Cover. The Permittee shall establish a vegetative or other appropriate cover within 90 days after completion of final grading requirements in the Application. Preparation of a vegetative cover shall include, but not be limited to, the placement of seed, fertilizer, mulch, and water.

C. Notice of Intent. The Permittee shall place in the operating record and notify ADEM of their intent to close the landfill prior to beginning closure.

D. Completion of Closure Activities. The Permittee must complete closure activities of each landfill unit in accordance with the Closure Plan within 180 days of the last known receipt of waste.

E. Certification of Closure. Following closure of each unit, the Permittee must submit to ADEM a certification, signed by an engineer, verifying the closure has been completed according to the Closure Plan.

F. Post-Closure Care Period. Post-closure care activities shall be conducted after closure of each unit throughout the life of this permit and continuing for a period of thirty (30) years following closure of the facility. ADEM may shorten or extend the post-closure care period applicable to the solid waste disposal facility. The Permittee shall reapply in order to fulfill the post-closure care requirements of this permit.

G. Post-Closure Maintenance. The Permittee shall provide post closure maintenance of the facility to include regularly scheduled inspections. This shall include maintenance of the cover, vegetation, monitoring devices and pollution control equipment and correction of other deficiencies that may be observed by ADEM. Monitoring requirements shall continue throughout the post closure period as determined by ADEM unless all waste is removed and no unpermitted discharge to waters of the State have occurred.

H. Post-Closure Use of Property. The Permittee shall ensure that post closure use of the property never be allowed to disturb the integrity of the final cover, liner, or any other component of the containment system. This shall preclude the growing of deep-rooted vegetation on the closed area.

I. Certification of Post-Closure. Following post-closure of each unit, the Permittee must submit to ADEM a certification, signed by an engineer, verifying the post-closure has been completed according to the Post-Closure Plan.

J. Notice in Deed to Property. The Permittee shall record a notation onto the land deed containing the property utilized for disposal within 90 days after permit expiration, revocation or when closure requirements are achieved as determined by ADEM as stated in the Application. This notation shall state that the land has been used as a solid waste disposal facility, the name of the Permittee, type of disposal activity, location of the disposal facility and beginning and closure dates of the disposal activity.

K. Recording Instrument. The Permittee shall submit a certified copy of the recording instrument to ADEM within 120 days after permit expiration, revocation, or as directed by ADEM as described in the Application.

L. Removal of Waste. If the Permittee, or any other person(s), wishes to remove waste, waste residues, or any liner or contaminated soils, the owner must request and receive prior approval from ADEM.

SECTION VIII. VARIANCES.

There are no approved variances for the Pine Hollow Inc. Landfill.

Any variance granted by ADEM may be terminated by ADEM whenever ADEM finds, after notice and opportunity for hearing, that the petitioner is in violation of any requirement, condition, schedule, limitation or any other provision of the variance, or that operation under the variance does not meet the minimum requirements established by state and federal laws and regulations or is unreasonably threatening the public health.

PINE HOLLOW INC.

PINE HOLLOW LANDFILL EXPANSION

HMM Project No. 237837AA01

October 2008

Hatch Mott MacDonald

120 Beckrich Road, Suite 180
Panama City Beach, FL 32407

AAC000035 EB0000155 LB00006783 LC26000216

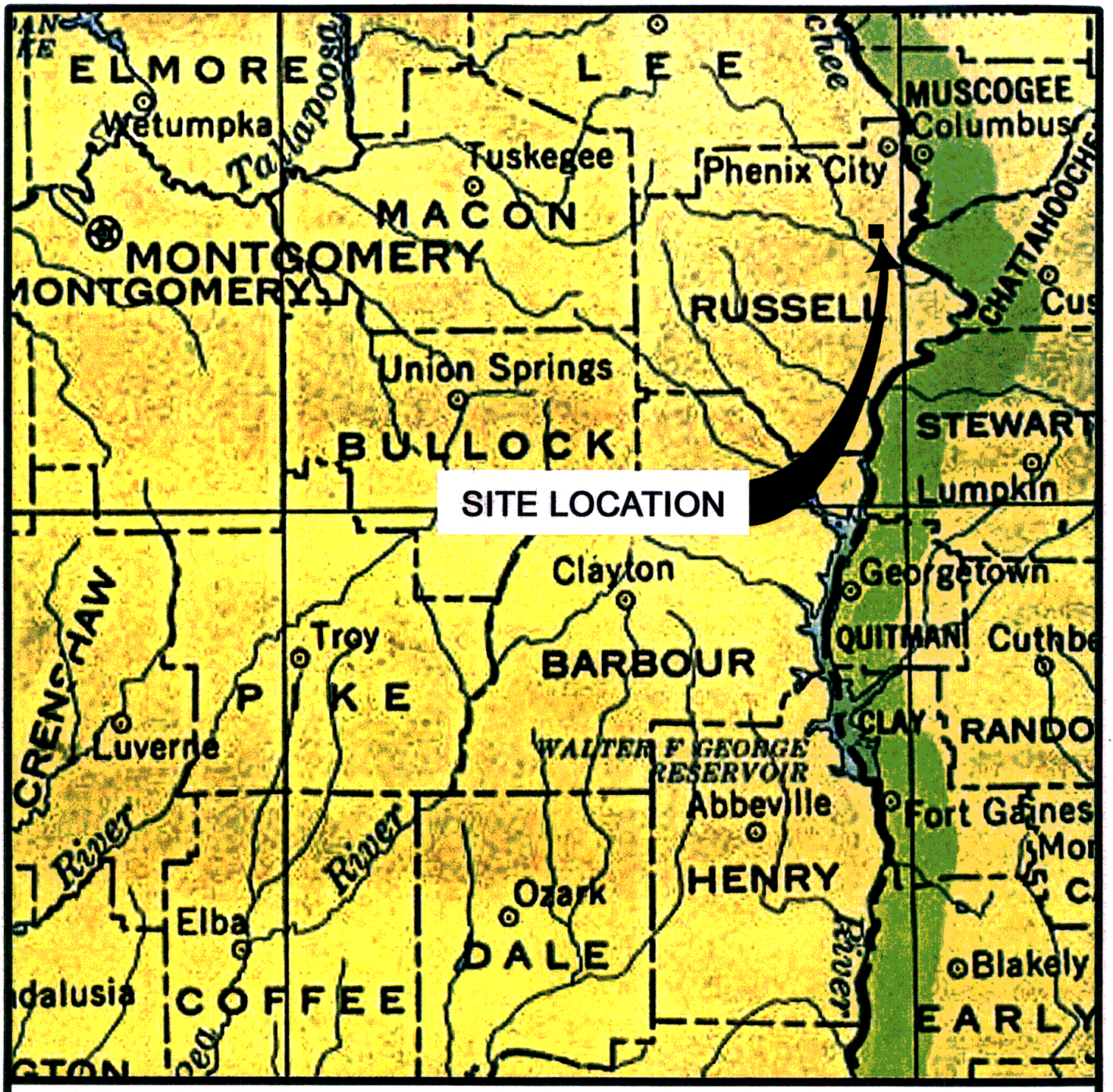
10/30/08

TABLE OF CONTENTS

1.0 INTRODUCTION

The existing Pine Hollow Landfill is a construction and demolition landfill, which was originally permitted by the Alabama Department of Environmental Management (ADEM) on March 20, 1995, (Permit No. 5707). The landfill accepts commercial and residential demolition material and foundry sand. Pine Hollow, Inc. (Pine Hollow) is proposing to expand the existing landfill to approximately 122 acres.

The Pine Hollow Landfill is located south of Phenix City in Russell County, Alabama (see "Site Vicinity Map, Figure 1). The landfill site and expansion has received host county approval and a statement of consistency from the Lee-Russell Council of Governments.



PINE HOLLOW LANDFILL
RUSSELL COUNTY, ALABAMA

SITE VICINITY MAP

FIGURE 1-1

2.0 Permit Modification Application

Solid waste Disposal Facility
Construction/Demolition Landfill
Alabama Department of Environmental Management
for
Pine Hollow Landfill

PERMIT APPLICATION
SOLID WASTE DISPOSAL FACILITY
CONSTRUCTION/DEMOLITION LANDFILL
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
(Submit in Triplicate)

The following application, with all required attachments, must be submitted before the Department will begin its review.

SECTION I:

LANDFILL ACTION: _____ New Application

_____ Renewal Application, Permit Number _____

__X__ Modification Application, Permit Number 57-07

LANDFILL NAME: Pine Hollow Inc. Landfill

LANDFILL ADDRESS (MAILING): 18 Old Brickkyard Rd.
Phenix City, AL 36869

LANDFILL ADDRESS (PHYSICAL): Brickyard Road (County Road 61)
Approximately 1500' West of Highway 165
Phenix City, Alabama

SECTION II:

APPLICANT/PERMITTEE:

NAME: Pine Hollow Inc.

ADDRESS: 18 Old Brickyard Rd.
Phenix City, AL 36869

TELEPHONE: 334-297-2140

If applicant/permittee is a Corporation, please list officers:

SECTION III:

LANDFILL OPERATOR:

Name: (1) Craig Reaves (2)

Address: 18 Old Brickyard Rd.

Phenix City, AL 36869

Telephone: 334-297-2140

SECTION IV:

CONTACT PERSON(S):

Name: (1) Craig Reaves (2)

Address: 18 Old Brickyard Rd.

Phenix City, AL 36869

Telephone: 334-297-2140

SECTION V:

LANDOWNER(S):

Name: (1) Pine Hollow Inc. (2)

Address: 18 Old Brickyard Rd.

Phenix City, AL 36869

Telephone: 334-297-2140

Attach copy of agreement from landowner giving permission to use site for disposal if landowner is different from applicant.

SECTION VI:

ADJACENT LANDOWNER(S):

a. Submit a list of all adjacent landowners including name and current mailing address

b. Submit a drawing/map identifying the proposed disposal site and the properties of all adjacent landowners listed in "a" above.

SECTION VII:

LOCAL APPROVAL: Yes Required (Yes or No)

9/3/2008 Date Received if needed (attach copy of resolution and proof of publishing public notice)

SECTION VIII:

WASTE DESCRIPTION:

a. Describe and list all waste streams/types to be accepted at landfill:

Construction and demolition debris, trees, limbs, stumps, clean foundry sand as cover material, used tires, and fiberglass insulation debris (Waste name MELT).

b. List proposed service area (geographic area or location(s)):

In Alabama:

Chambers, Russell, Lee, Macon, Barbour

In Georgia: Muscogee, Harris, Chattahoochee, Talbot, Meriweather, Troup

Foundry sand to be used as cover dirt.

c. What is the maximum daily volume of waste to be received at the landfill? (Select One)

500 tons per day _____ cubic yards per day

SECTION IX:

SITE DESCRIPTION:

a. Attach location map with the site clearly identified. Acceptable maps include a USGS 7.5 or 15 minute series, a county highway map published by the Alabama Department of Transportation.

b. Location:

County: Russell

Part: _____ of Section(s): 4

Township(s): 16N Range(s): 30E

c. Attach legal property description and boundary plat of the permitted area and disposal area prepared and signed by a licensed land surveyor.

d. Size of permitted area: 122 +/- acres

e. Size of disposal area: 102 +/- acres

SECTION X:

This Section is to be completed by the applicants/permittees. A copy of all concurrence letters must be attached to this application upon submittal to the Department.

Location Standards: (Rule 335-13-4-.01(1) Supporting documentation submitted in the December, 1997 application

a. Is the landfill located in the 100-year flood plain? (need to have flood plain map)

NO: __X__ YES: ____

b. Does the proposed landfill disposal area:

(1.) Jeopardize the continued existence of endangered or threatened species protected under the Endangered Species Act of 1973?

NO: _X__ YES: ___(Attach letter from U.S. Dept. of Interior or Alabama Fish and Wildlife)

(2.) Result in the destruction or adverse modification of critical habitats protected under the Endangered Species Act of 1973?

NO: __X_ YES: ___ (Attach letter from U.S. Dept. of Interior or Alabama Fish and Wildlife)

c. Is the proposed landfill located in a zone of active faults, seismic impact zones and unstable areas?

NO: __X__ YES: ____

(If YES then all required seismic studies should be submitted to the Department.)

d. Is the proposed landfill located in an area that is archaeologically sensitive?

NO: __X__ YES: ____ (Attach letter from State Historic Preservation Officer)

Water Quality Standards (Rule 335-13-4-.01(2):
(ADEM Water Division should be contacted to determine if permit is required)

a. Will the proposed landfill discharge pollutants to waters of the State in violation of requirements of the National Pollutant Discharge Elimination System (NPDES) Permit?

NO: __X__ YES: ____

b. Will the proposed landfill violate any requirement of an area wide or Statewide water quality plan that has been approved under the Alabama Water Pollution Control Act?

NO: __X__ YES: ____

c. Will any part of the landfill, including buffer zone, be located in wetlands, beaches, dunes?

NO: __X__ YES: ____

d. Will solid waste be disposed in any location which will significantly degrade wetlands, beaches, or dunes?

NO: __X__ YES: ____

e. Will the proposed landfill be located outside the boundaries of the coastal area? (If not, then all demonstrations should be submitted to the Department for review.)

NO: ____ YES: __X__

Groundwater Elevations:

Has a minimum five-foot separation between the floor of the disposal cell and the groundwater been established? NO: ____ YES: __X__

SECTION XI:

GENERAL COMMENTS:

All materials listed in Rules 335-13-4-.12 to 335-13-4-.17, Rules 335-13-4-.19 to 335-13-4-.20, and Rule 335-13-4-.23 shall be kept at the landfill office along with a copy of the engineering drawings which must be submitted to the Department for review.

The applicant/permittee is responsible for obtaining a copy of the Division 13 regulations and complying with all Rules related to construction/demolition landfill units.

SECTION XII:

CERTIFICATION OF LOCAL GOVERNMENT APPROVAL:

Upon submittal of this application, we the undersigned certify that local approval has been obtained from Russell County (city/county). Evidence of this local approval is contained in documents which are on file at the permit applicant's business address.

CERTIFICATION OF COMPLIANCE:

Upon submittal of this application, we the undersigned certify that this document and all attachments submitted are to the best of our knowledge and belief, true, accurate, and complete. We also understand that if any of the material certified to above has not been received, or is not complete or is not accurate, that shall be grounds for the Department to revoke the landfill permit if issued.

SIGNATURE (Responsible official of permit applicant):

_____ TITLE: President

Craig Reaves DATE: 10/31/08

(please print or type name)

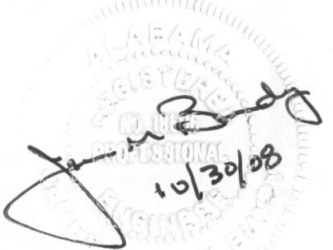
SIGNATURE (Certifying Engineer):

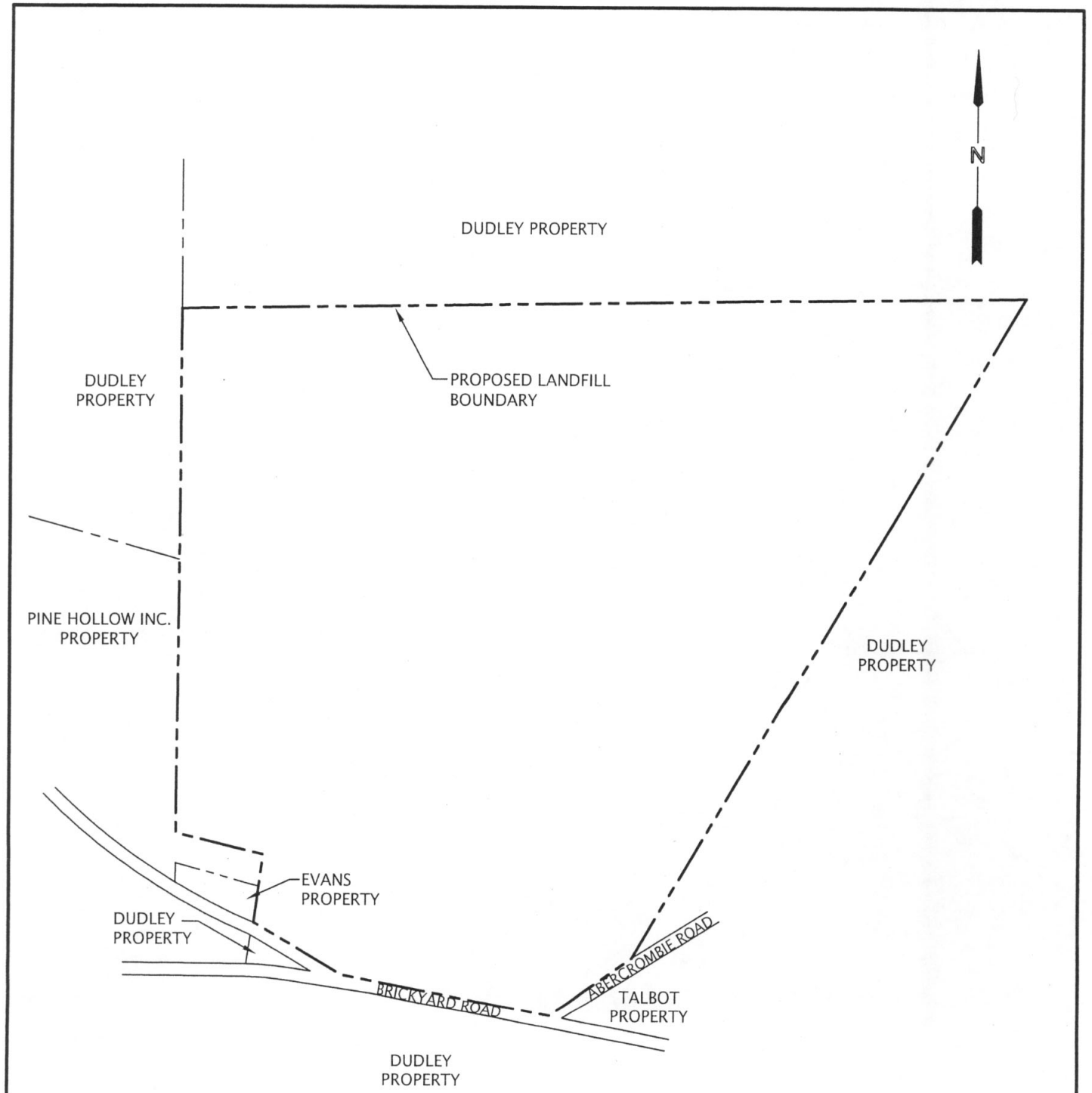
_____ TITLE: Vice President

James M. Bundy DATE: 10/30/08

(please print or type name)

FIRM: Hatch Mott MacDonald STAMP OR SEAL:





ADJACENT LANDOWNERS

N.T.S.

2.2 List of Adjacent Land Owners

1. John McDudley
   PO Box 639
   Phenix City, Alabama 36868

2. Jim Talbot
   1906 Britton Rd
   Phenix City, Alabama 36867

3. Pine Hollow Inc.
   18 Old Brickyard Rd
   Phenix City, Alabama 36869

4. Mary Evans
   PO Box 614
   Phenix City, Alabama 36868

LRC
LEE-RUSSELL
COUNCIL OF GOVERNMENTS
AREA AGENCY ON AGING

Mayor Bill Ham, Jr.
Chairman

Suzanne G. Burnette
Executive Director

STATEMENT OF CONSISTENCY

The Lee-Russell Council of Governments (LRCOG), a regional planning and development agency, received a request for a statement of consistency on September 19, 2008 for a proposed expansion of the Pine Hollow Landfill. Local approval for this proposal was given by the Russell County Commission on September 3, 2008.

LRCOG, in issuing a "Statement of Consistency" is to evaluate the proposal using the 2003 Regional Solid Waste Needs Assessment.

Based upon the approval and support of the Russell County Commission and the information provided in the 2003 Regional Solid Waste Needs Assessment, there appears to be consistency and we therefore issue this "Statement of Consistency".

Suzanne Burnette 10/16/08

Executive Director — Date
Lee-Russell Council of Governments

10/16/08

Van Vanoy — Date
Notary Public

NOTARY PUBLIC STATE OF ALABAMA AT
MY COMMISSION EXPIRES
BONDED THRU NOTARY PUBLIC UNDERWRITERS

2207 Gateway Drive • Opelika, Alabama 36801-6834 • (334) 749-5264 • FAX (334) 749-6582
www.lrcog.com

CERTIFICATE OF LOCAL APPROVAL
FOR
SOLID WASTE MANAGEMENT FACILITIES

On 21 July, 2008, the Pine Hollow, Inc. landfill applied to the Russell County Commission for:

A new solid waste management facility to be located at the existing Pine Hollow, Inc. landfill on Brickyard Rd., which will facilitate the disposal of construction and demolition debris.

Furthermore, public notice was given at least 30 but no more than 45 days prior to the published date of the required public hearing.

The notice contained the following information:

1. A description of the proposed action to be considered.

2. The relevancy and consistency of the proposed action on the solid waste management facility with the Solid Waste Management Plan.

3. The notice identified the contact person from whom interested parties could obtain additional information and review copies of both the Solid Waste Management Plan and the application of the proposal of Pine Hollow, Inc.

All pertinent documents relating to the application of proposal made by Pine Hollow, Inc. were made available for public inspection at the Russell County Courthouse, a location readily accessible to the public, during normal business hours of 8 AM to 5 PM.

In determining whether to recommend approval of the proposed issuance of or modification of a new or existing solid waste management site, the Russell County Commission did consider, at a minimum, the following:

1. The consistency of the proposal with the jurisdiction's solid waste management need as identified in its plan;

2. The relationship of the proposal to the local planned or existing development or the absence thereof to major transportation arteries and to existing state primary and secondary roads;

3. The location of the proposed facility in relationship to existing industries in the state that generate large volumes of solid waste, or the relationship to the areas projected for development of industries that will generate solid waste;

4. Costs and availability of public services, facilities, and improvements required to support a proposed facility and protect public health, safety, and the environment;

5. The impact of a proposed facility on public safety and provisions made to minimize the impact on public health and safety; and

6. The social and economic impacts of a proposed facility on the affected community, including changes in the property values, and social or community perception.

On 26 August, 2008, at a public meeting the Russell County Commission approved the proposed issuance of or modification of a permit for Pine Hollow, Inc. on Brickyard Rd. with the following conditions:

1. Description of facility to be built or modified:
   Construction and Demolition waste facility

2. Service Area:
   In Alabama: Chambers, Russell, Lee, Macon, Barbour
   In Georgia: Muscogee, Harris, Chattahoochee, Talbot, Meriwether, Troup

3. Volume of wastes to be accepted:
   500 tons per day

4. Types of wastes to be accepted:
   Construction and demolition debris, trees, limbs, stumps, tires, clean foundry sand as cover material.

5. Life of facility:
   40 years

6. Conditions given to local governing body as a condition of approval:
   None

For the following reasons:
   Needed by local industry.

I hereby certify that the above information is a true and accurate version of the events as they occurred.

Signature of Authorized Official
of Local Governing Body

09/03/08
Date

Signature of Notary

Sept 3, 2008
Date

MY COMMISSION EXPIRES
MAY 30, 2011

Excerpts From the minutes of Russell County Commission Meeting dated August 26th, 2008:

Pine Hollow Landfill, represented by James McGill, requested an approval for the renewal and the expansion of the landfill from 50 acres to 120 acres. There were no objections at the public hearing, held prior to the regular Commission Meeting, and they have met all ADEM requirements. The owners are requesting written approval from the Commission in accordance with ADEM rules and regulations. Commissioner Lee motioned to approve the renewal and expansion of Pine Hollow Landfill. Seconded by Commissioner Epps. The Commission was polled; District 1(Lee) voted, yes; District 2 (Cox) voted, yes; District 3 (Martin) voted, yes; District 4 (Robinson) absent; District 5 (Epps) voted, yes; District 6 (Dudley) voted, yes; District 7(Upshaw) voted, yes. The vote was unanimous.

I, LeAnn Horne, County Administrator, Russell County Commission, do hereby certify that the foregoing is a true and correct copy of the official minutes of the Russell County Commission regular meeting of August 26th, 2008 pending final approval of minutes at the regular Russell County Commission Meeting, September 8th, 2008.

Witness my hand this 3rd, day of September 2008.

LeAnn Horne

LeAnn Horne, County Administrator

PUBLIC NOTICE
LEGAL ADVERTISMENT

NOTICE IS HEREBY GIVEN FOR A PUBLIC HEARING TO BE HELD BY THE RUSSELL COUNTY COMMISSION ON AUGUST 26, 2008 AT 10 A.M. EDT IN THE RUSSELL COUNTY COMMISSION CHAMBERS AT THE RUSSELL COUNTY COURTHOUSE, 501 14TH STREET, PHENIX CITY, ALA., 36867. PUBLIC COMMENT WILL BE ACCEPTED AT THIS TIME FOR THE EXPANSION OF THE PERMIT FOR THE PINE HOLLOW INC., SOLID WASTE LANDFILL, WHICH IS A CONSTRUCTION/DEMOLITION DEBRIS LANDFILL, LOCATED ON BRICKYARD ROAD IN RUSSELL COUNTY, ALABAMA. INTERESTED PERSONS MAY REVIEW COPIES OF THE MODIFICATIONS AT THE OFFICE OF THE RUSSELL COUNTY ADMINISTRATOR, 501 14TH STREET, PHENIX CITY, ALA., 36867

/s/ Gordon Cox
RUSSELL COUNTY COMMISSION CHAIRMAN

3.0 SITE DESCRIPTION

3.1 LOCATION

The Pine Hollow Landfill is located south of Phenix City in Russell County, Alabama. The overall site, including the expansion, is approximately 122 acres and is bordered to the south by County Road 61 (Brickyard Road). The landfill is located within Section 4 of Township 16 North, Range 30 East. A site location map, prepared from the Phenix City Quadrangle, is shown in Figure 3-1.

3.2 LEGAL DESCRIPTION / PERMANENT MARKERS

The legal descriptions of the landfill boundary are included in Attachment 3-1. The disposal area boundary is shown on Drawing C-1. Permanent concrete monuments will be installed at the corners of the landfill boundaries.

3.3 CONTROL POINTS

Benchmarks have been established on-site to provide accurate horizontal and vertical control for the facility during construction, operation, closure, and post-closure.

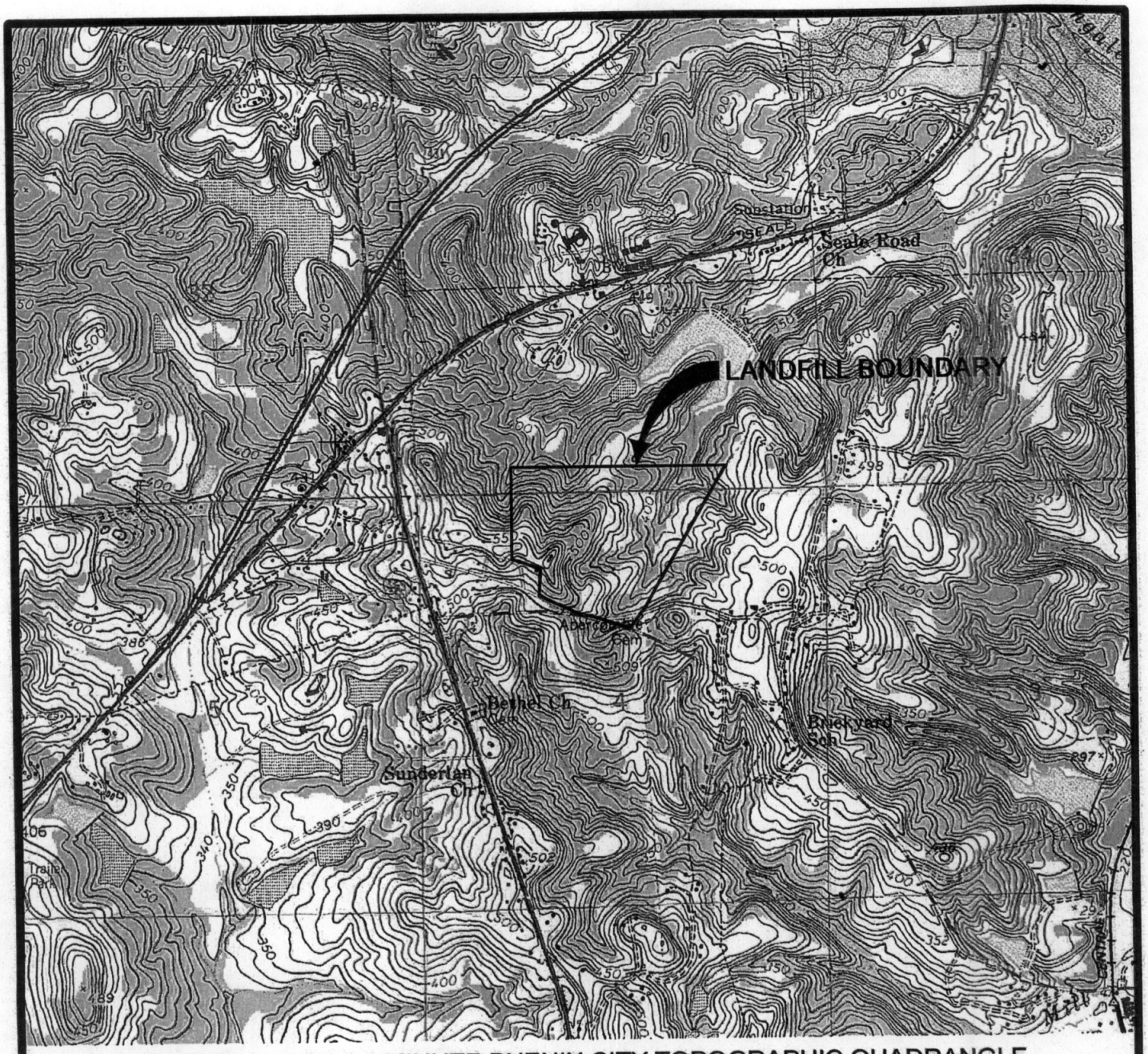
3.4 LAND USE AND ZONING

The landfill is located in an unincorporated area of Russell County which is not zoned. The land use in the area is industrial (Brickyard), commercial, silvaculture, residential and naturally wooded. A portion of the Phenix City Quadrangle is included in Figure 3-2

"Land Use Within 5,280 Feet of Site Boundary," which shows the location of buildings, water courses, and other topographic features. Water wells within the area are discussed in Section 5, "Site Geology and Hydrogeology".

3.5 EXISTING TOPOGRAPHY

The landfill site is bordered to the south by County Road 61 (Brickyard Road) and to the east by an unimproved road (dirt) and power line easement. The west boundary is wooded property with a residential area beyond the wooded property. The area towards the north is wooded. The surface generally has a moderate slope and includes two erosion features. The existing site topography is shown in the permit drawings.

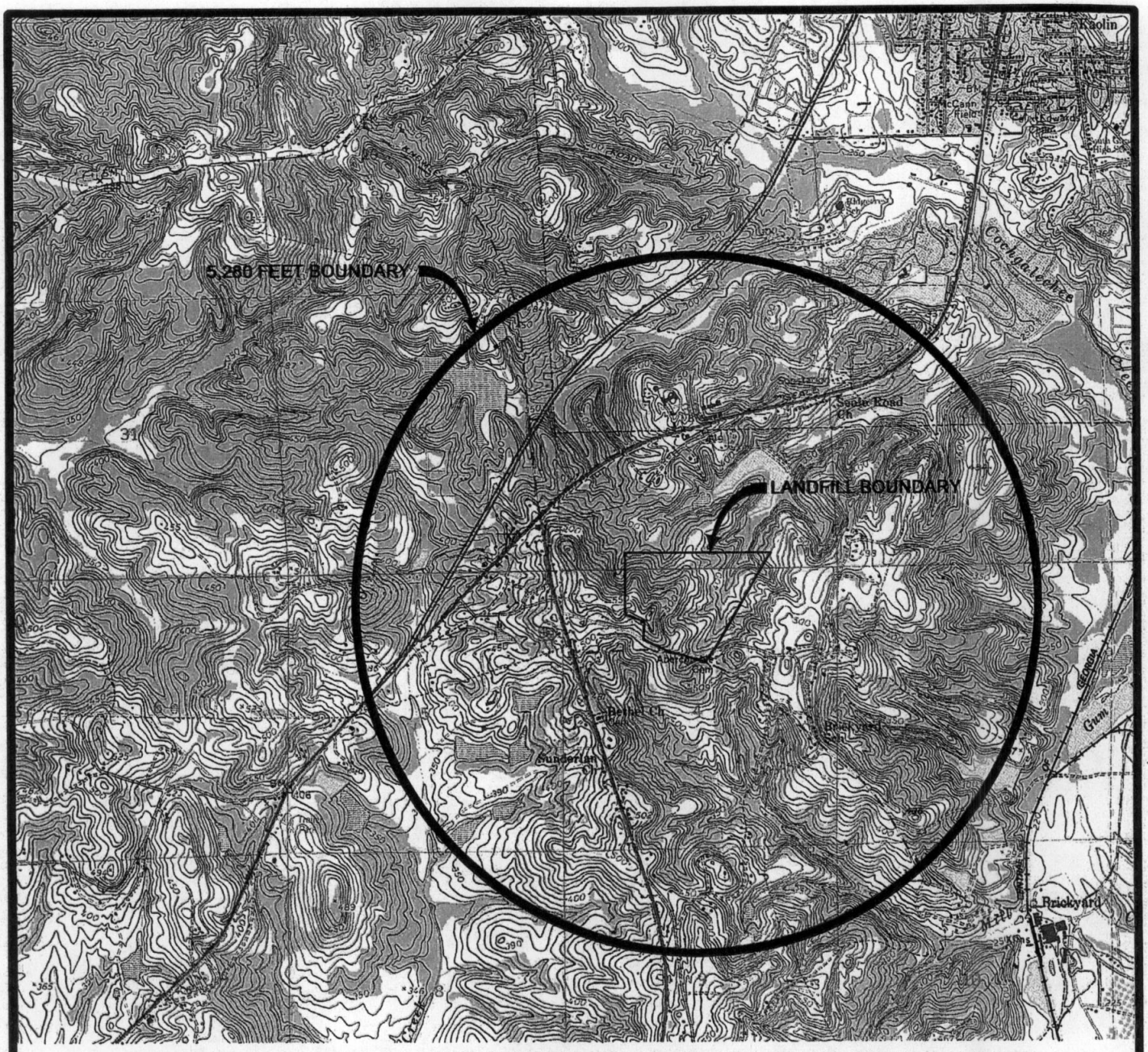


SOURCE: USGS 7.5 MINUTE PHENIX CITY TOPOGRAPHIC QUADRANGLE
SCALE 1:24,000 (1 INCH = 2,000 FEET)

PINE HOLLOW LANDFILL
RUSSELL COUNTY, ALABAMA

SITE LOCATION MAP

FIGURE 3-1



SOURCE: USGS 7.5 MINUTE PHENIX CITY TOPOGRAPHIC QUADRANGLE
SCALE 1:36,000 (1 INCH = 3,000 FEET)

PINE HOLLOW LANDFILL
RUSSELL COUNTY, ALABAMA

LAND USE WITHIN 5,280 FEET OF LANDFILL BOUNDARY

FIGURE 3-2

NOTES

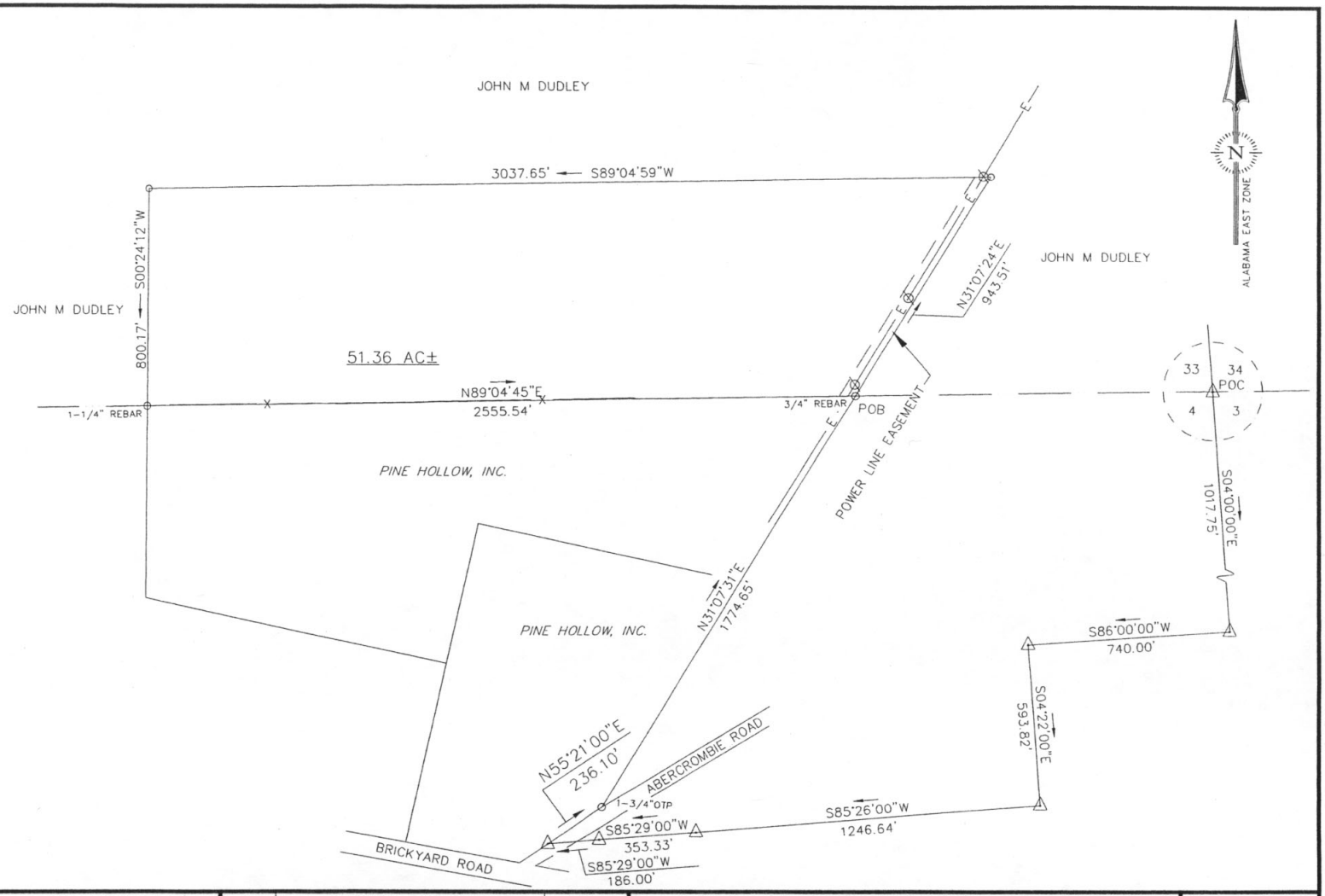
) THE LAND SURVEYOR WHOSE SEAL IS AFFIXED HEREON
OES NOT GUARANTEE THAT ALL EASEMENTS WHICH MAY
FFECT THIS PROPERTY ARE SHOWN.
) SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD.
) ALL PROPERTY CORNERS FOUND ARE 1/2" REBAR &
AP (McBRIDE) UNLESS OTHERWISE NOTED.
) SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD.
) VERTICAL DATUM IS NAVD 88.

LEGEND

o	IRON PIN FOUND
≈	NOT TO SCALE
—X—	FENCE LINE
CTP	CRIMPED TOP PIPE
OTP	OPEN TOP PIPE
RBC	1/2" REBAR & CAP
POC	POINT OF COMMENCEMENT
POB	POINT OF BEGINNING
⊗	UTILITY POLE
△	CALCULATED POINT
	MONITORING WELL
GAP	GROUND AT PIPE
GRD	GROUND ELEVATION

HEREBY STATE THAT ALL PARTS OF THIS SURVEY AND
RAWING HAVE BEEN COMPLETED IN ACCORDANCE WITH THE
URRENT REQUIREMENTS OF THE STANDARDS OF PRACTICE
OR SURVEYING IN THE STATE OF ALABAMA TO THE BEST
F MY KNOWLEDGE, INFORMATION AND BELIEF."

_____ DATE: _____
NATHAN McBRIDE
EG. NO. 23345



McBride-McGill, LLC.
Engineering & Surveying
2505 Crawford Rd., Phenix City, AL. 36867
Office: (334) 297-5717 * Fax: (334) 297-1066
Email: comments@mcbride-mcgill.com

REV	REVISION DESCRIPTION	DATE

DATE OF FIELD WORK: 4/22/2008
JOB NO: 1010-08 | DRAWN BY: BSH

THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT UNLESS IT HAS BEEN PROPERLY SEALED AND BEARS THE ORIGINAL SIGNATURE OF A REGISTERED PROFESSIONAL OF MCBRIDE-MCGILL, LLC.

PARCEL OF LAND CONTAINING 51.3 ACRES±

MONITOR WELLS LOCATION SURVEY

SECTION-33, TOWNSHIP-17-NORTH, RANGE-30-EAST
RUSSELL COUNTY, ALABAMA

PREPARED FOR:
REAVES WRECKING CO.,INC

DATE: 4/30/2008
SCALE: 1" = 400'
SHEET NO: 1 OF 1

Barrett & McPherson, Inc.
Engineers & Land Surveyors

4 February, 1994

LEGAL DESCRIPTIONS: Property to be conveyed by John M. Dudley, Sr. to Reeves Wrecking Company, Inc.

Parcel "A":

All that tract or parcel of land containing 20.00 acres located in and being a part of Section 4, Township 16 North, Range 30 East, Russell County, Alabama, being a portion of the land conveyed to John M. Dudley, Sr. by Marjorie B. Bickerstaff, et al by Warranty Deed dated 16 September, 1991 and recorded in Deed Record Book 738 at page 159 in the Office of the Judge of Probate of Russell County, Alabama, and being more particularly described as follows:

Starting at the Northeast corner of Section 4, Township 16 North Range 30 East, Russell County, Alabama, go South 04 degrees 00 minutes East 1017.75 feet; thence South 86 degree 00 minutes West 740 feet; thence South 04 degrees 22 minutes East 593.82 feet; thence South 85 degrees 26 minutes West 1246.64 feet; thence South 85 degrees 29 minutes West 353.33 feet to an iron pin; thence South 85 degrees 34 minute West 186.0 feet to an iron pin on the North right of way of Abercrombie Road, also being the POINT of BEGINNING; thence continue South 85 degrees 34 minutes West 335.5 feet to an iron pin on the North right of way of Brickyard Road, also known as Russell County Highway 61; thence along the North right of way of Brickyard Road, as it curves, concave South, with a radius of 4018.47 feet, a chord of North 79 degrees 17 minutes West 163.8 feet to an iron pin at the Southeast corner of the property of Jake McIntyre; thence along the East line of the property of Jake McIntyre, and a projection thereof, North 09 degrees 17 minutes East 1160.7 feet to an iron pipe; thence South 80 degrees 43 minutes East 971.2 feet; thence

121 W. Broad St., P.O. Box 82
Eufaula, Alabama 36072-0082
205-687-4257
Fax 205-687-8829

South 27 degrees 57 minutes West 972.8 feet to an iron pipe on the aforementioned North right of way of Abercrombie Road; thence along the North right of way of Abercrombie Road South 55 degrees 21 minutes West 236.1 feet to the POINT of BEGINNING.

Parcel "B":

All that tract or parcel of land containing 0.27 acre located in and being a part of Section 4, Township 16 North, Range 30 East, Russell County, Alabama, being more particularly described as follows:

Starting at the Northeast corner of Section 4, Township 16 North Range 30 East, Russell County, Alabama, go South 04 degrees 00 minutes East 1017.75 feet; thence South 86 degree 00 minutes West 740 feet; thence South 04 degrees 22 minutes East 593.82 feet; thence South 85 degrees 26 minutes West 1246.64 feet; thence South 85 degrees 29 minutes West 353.33 feet to an iron pin; thence South 85 degrees 34 minutes West 186.0 feet to an iron pin on the North right of way of Abercrombie Road, also being the POINT of BEGINNING; thence continue South 85 degrees 34 minutes West 335.5 feet to an iron pin on the North right of way of Brickyard Road, also known as Russell County Highway 61; thence along the North right of way of Brickyard Road, as it curves, concave South, with a radius of 4018.47 feet, a chord of South 76 degrees 26 minutes East 235.8 feet to an iron pin at the intersection of said North right of way of Brickyard Road and the aforementioned North right of way of Abercrombie Road; thence along the North right of way of Abercrombie Road North 52 degrees 21 minutes East 132.9 feet to the POINT of BEGINNING.

Barrett &
McPherson, Inc.
Engineers & Land Surveyors

16 January, 1997

LEGAL DESCRIPTIONS: Property to be conveyed by John M. Dudley, Sr. to Reaves Wrecking Company, Inc.

Parcel "D":

All that tract or parcel of land containing 18.27 acres located in and being a part of Section 4, Township 16 North, Range 30 East, Russell County, Alabama, being a portion of the land conveyed to John M. Dudley, Sr. by Marjorie B. Bickerstaff, et al by Warranty Deed dated 16 September, 1991 and recorded in Deed Record Book 738 at page 159 in the Office of the Judge of Probate of Russell County, Alabama, and being more particularly described as follows:

Starting at the Northeast corner of Section 4, Township 16 North, Range 30 East, Russell County, Alabama, go South 04 degrees 00 minutes East 1017.75 feet; thence South 86 degrees 00 minutes West 740 feet; thence South 04 degrees 22 minutes East 593.82 feet; thence South 85 degrees 26 minutes West 1246.64 feet; thence South 85 degrees 29 minutes West 353.33 feet to an iron pin; thence South 85 degrees 34 minutes West 521.5 feet to an iron pin on the North right of way of Brickyard Road, also known as Russell County Highway 61; thence along the North right of way of Brickyard Road, as it curves, concave South, with a radius of 4018.47 feet, a chord of North 79 degrees 17 minutes West 163.8 feet to an iron pin at the Southeast corner of the property conveyed by Jake McIntyre to Reaves Wrecking Company, Inc.; thence along the East line of the property conveyed by McIntyre to Reaves North 09 degrees 17 minutes East 634.7 feet to an iron pin; thence along the North line of the property conveyed by McIntyre to Reaves North 80 degrees 43 minutes West 779.9 feet to an iron pin, also being the POINT of BEGINNING; thence continue along the North line of the property conveyed by McIntyre to Reaves North 80 degrees 43 minutes West 329.5 feet to an iron pin; thence North 02 degrees 48 minutes West 710.7 feet to an iron pin on the North line of Section 4, Township 16 North, Range 30 East; thence along the North line of Section 4 North 85 degrees 54 minutes East 2555.3 feet to an iron pin; thence South 27 degrees 57 minutes West 505.9 feet to an iron pin; thence North 82 degrees 58 minutes West 1909.5 feet to an iron pin; thence South 04 degrees 26 minutes West 734.8 feet to the POINT of BEGINNING.

121 W. Broad St., P.O. Box 82
Eufaula, Alabama 36072-0082
334-687-4257
Fax 334-687-8829

Parcels "C and D combined":

All that tract or parcel of land containing 38.27 acres located in and being a part of Section 4, Township 16 North, Range 30 East, Russell County, Alabama, being a portion of the land conveyed to John M. Dudley, Sr. by Marjorie B. Bickerstaff, et al by Warranty Deed dated 16 September, 1991 and recorded in Deed Record Book 738 at page 159 in the Office of the Judge of Probate of Russell County, Alabama, and being more particularly described as follows:

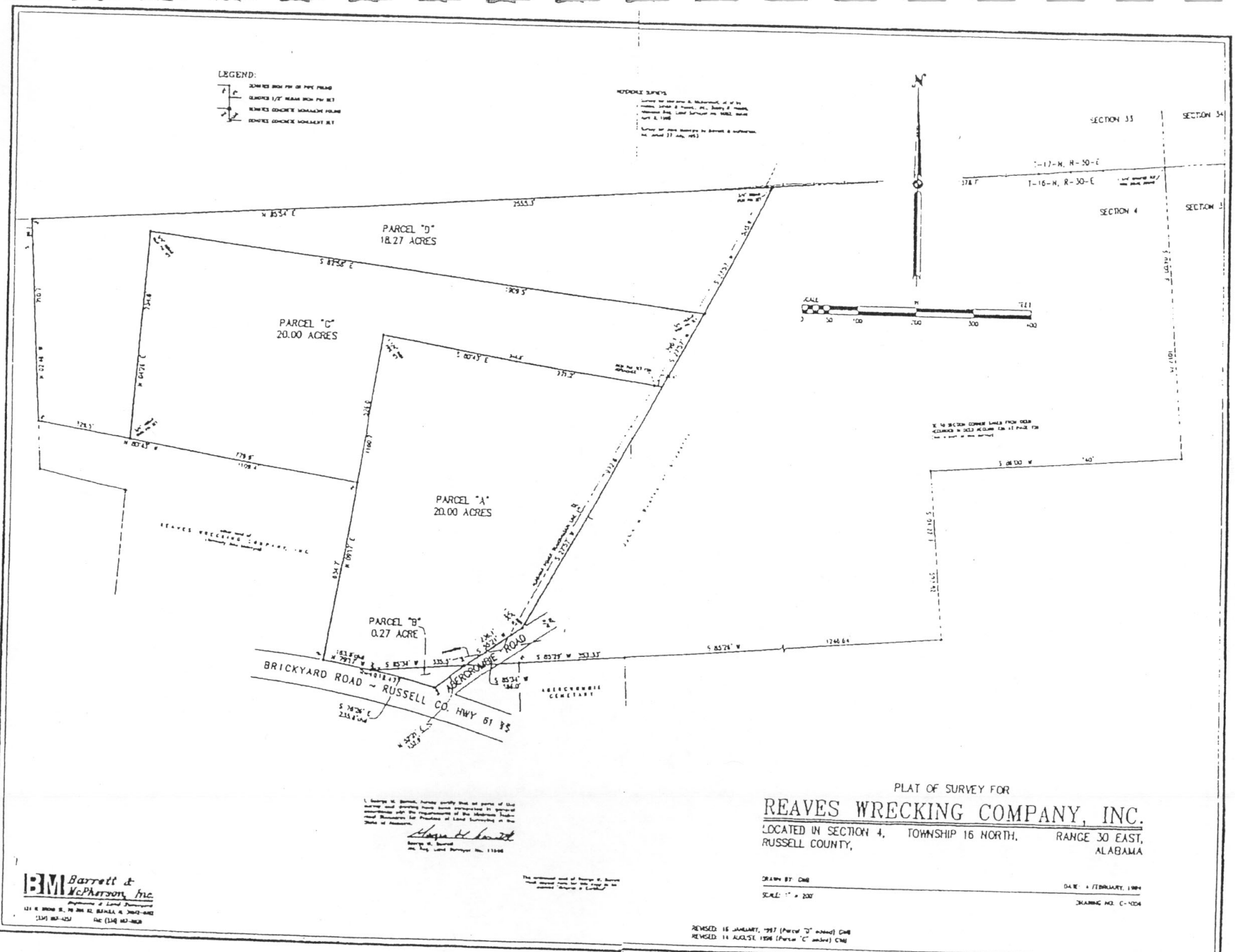
Starting at the Northeast corner of Section 4, Township 16 North, Range 30 East, Russell County, Alabama, go South 04 degrees 00 minutes East 1017.75 feet; thence South 86 degrees 00 minutes West 740 feet; thence South 04 degrees 22 minutes East 593.82 feet; thence South 85 degrees 26 minutes West 1246.64 feet; thence South 85 degrees 29 minutes West 353.33 feet to an iron pin; thence South 85 degrees 34 minutes West 521.5 feet to an iron pin on the North right of way of Brickyard Road, also known as Russell County Highway 61; thence along the North right of way of Brickyard Road, as it curves, concave South, with a radius of 4018.47 feet, a chord of North 79 degrees 17 minutes West 163.8 feet to an iron pin at the Southeast corner of the property conveyed by Jake McIntyre to Reaves Wrecking Company, Inc.; thence along the East line of the property conveyed by McIntyre to Reaves North 09 degrees 17 minutes East 634.7 feet to an iron pin, also being the POINT of BEGINNING; thence along the North line of the property conveyed by McIntyre to Reaves North 80 degrees 43 minutes West 1109.4 feet to an iron pin; thence North 02 degrees 48 minutes West 710.7 feet to an iron pin on the North line of Section 4, Township 16 North, Range 30 East; thence along the North line of Section 4 North 85 degrees 54 minutes East 2555.3 feet to an iron pin; thence South 27 degrees 57 minutes West 802.0 feet to an iron pin; thence North 80 degrees 43 minutes West 971.2 feet to an iron pin; thence South 09 degrees 17 minutes West 526.0 feet to the POINT of BEGINNING.

BCM

LEGAL DESCRIPTION OF THE PINE HOLLOW LANDFILL DISPOSAL AREA BOUNDARY

COMMENCE AT THE N.E. CORNER OF SECTION 4, TOWNSHIP 16 N RANGE 30 E, RUSSELL COUNTY, ALABAMA; THENCE RUN S 04° 00' 00" E, 1017.75 FEET; THENCE RUN S 86° 00' 00" W, 740 FEET; THENCE RUN S 04° 22' 00" E, 593.82 FEET; THENCE RUN S 85° 29' 00" E, 353.33 FEET TO AN IRON PIN; THENCE RUN S 85° 34' 00" W, 186.0 FEET TO AN IRON PIN ON THE NORTH RIGHT OF WAY OF ABERCROMBIE ROAD, THENCE RUN N 76° 13' 10" W, 133.66 FEET; THENCE RUN N 77° 04' 38" W, 133.59 FEET; THENCE RUN N 59° 11' 56" W, 132.47 FEET; THENCE RUN N 09° 17' 00" E, 917.89 FEET; THENCE RUN S 80° 43' 00" E, 621.61 FEET; THENCE RUN S 11° 12' 55" W, 366.23 FEET; THENCE RUN S 27° 57' 00" W, 421.15 FEET; THENCE RUN 55° 21' 00" W, 302.58 FEET TO THE POINT OF BEGINNING.

SAID DESCRIBED PROPERTY LYING IN SECTION 4, TOWNSHIP 16 N, RANGE 30 E, RUSSELL COUNTY, ALABAMA CONTAINING 11.79 ACRES MORE OR LESS.



PLAT OF SURVEY FOR

REAVES WRECKING COMPANY, INC.

LOCATED IN SECTION 4, TOWNSHIP 16 NORTH, RANGE 30 EAST,
RUSSELL COUNTY, ALABAMA

DRAWN BY: CMB

DATE: 4 FEBRUARY, 1994

SCALE: 1" = 200'

DRAWING NO. C-4054

REVISED: 16 JANUARY, 1997 (Parcel "D" added) CMB
REVISED: 14 AUGUST 1998 (Parcel "C" added) CMB

BM Barrett & McPherson, Inc.
Engineers & Land Surveyors
121 E. Broad St., PO Box 82, Eufaula, AL 36072-0082
(334) 687-4251 FAX (334) 687-8628

4.0 SITE GEOLOGY AND HYDROGEOLOGY

4.1 REGIONAL GEOLOGY

The site lies within the Alluvial Plain Physiographic District within the East Gulf Coastal Plain Physiographic Section.

Geologic formations that crop out in and underlie the study area range in age from Precambrian to Quaternary. Metamorphic and igneous rocks crop out in stream valleys in Russell County in channels of the Chattahoochee River and adjacent streams in the vicinity of Phoenix City. Unconsolidated sedimentary deposits of Late Cretaceous age crop out in most of Russell County. Alluvial and terrace deposits overlie older rocks in and adjacent to the flood plains for the major streams and their tributaries.

Sedimentary deposits of Late Cretaceous age overlie the metamorphic and igneous rocks throughout most of the area. The rocks generally strike east – west and dip south – southwest about 35 ft/mi (Kidd, 1987).

Two formations that potentially crop out in the vicinity of the site are The Tuscaloosa Formation and The Eutaw Formation.

The Tuscaloosa Formation unconfirmaly overlies the pre-Cretaceous igneous and metamorphic rocks and crops out in a broad and in northern Russell County. The formation underlies all of the area south of its outcrop, and is one of the major aquifers. The Tuscaloosa Formation consists of sand and gravel interbedded with clay and some thin beds of sandstone. The formation ranges in thickness from less than 50 feet in the northern part of the Russell County to more than 1,300 feet in the southern part of Barbour County (Scott, 1962).

The Eutaw Formation overlies the Tuscaloosa Formation and crops out immediately south of the Tuscaloosa Formation in a narrow belt in northern Russell County. The Eutaw consists of 150 to 325 feet of marine sand, clay, and calcareous fossiliferous sandstone. The Eutaw Formation is a major aquifer in central and southern Russell County (Scott, 1960).

Alluvial and terrace deposits of Pleistocene to Holocene age overlie older formations in and adjacent to the valleys of the larger streams in the area. These deposits generally consist of 5 to 50 feet of sand, gravel, boulders, and clay. The alluvial and terrace deposits are a potential source of groundwater, but are not developed for public water supplies in the area (Kidd, 1987).

4.2 SITE GEOLOGY

Geotechnical and Environmental Consultants Inc. (GEC) completed the soils investigation for the landfill expansion area. The investigation included 12 borings which were developed into piezometer. Two types of soil were generally found in the surface layer which consisted of a tan fine silty sand and a orange clayey material. The subsoil is either a tan, sandy clay or a tan to orange, to fine grained clayey sand to an average depth of 10 feet, grading into a gray, red gray stiff clay at greater depths. The boring logs are included in GEC's. Report provided in Attachment 4-1

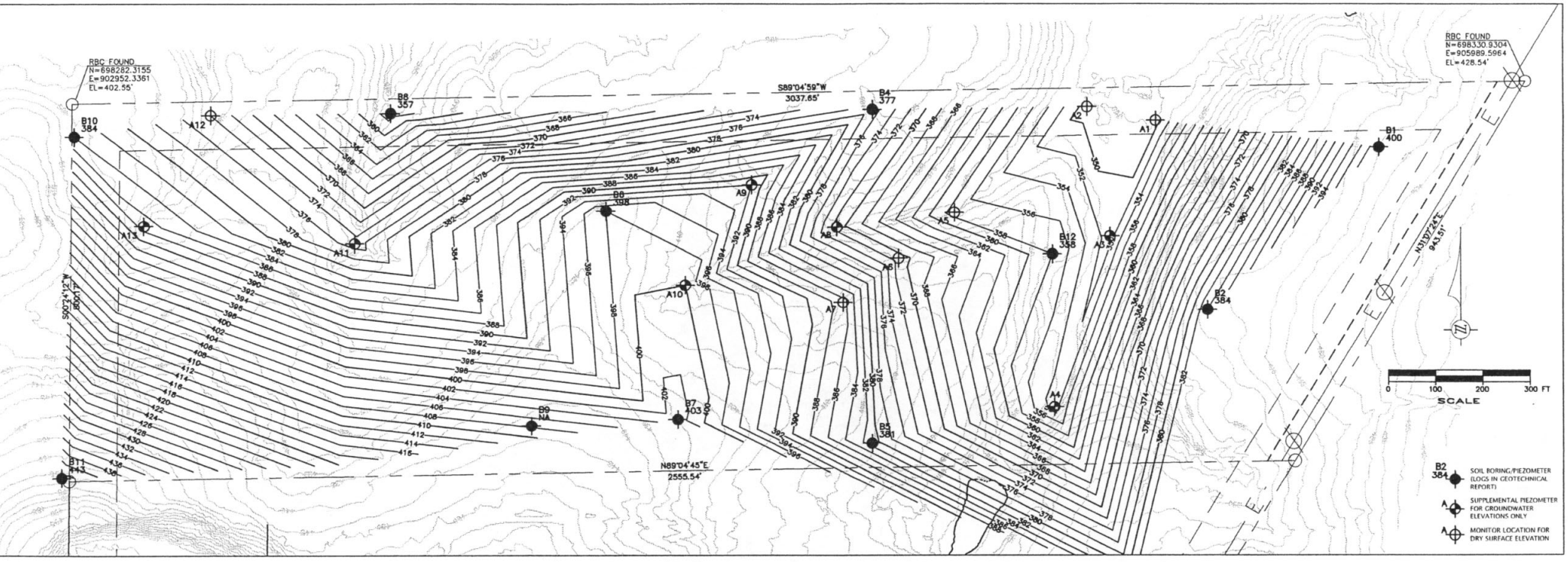
4.3 GROUNDWATER

The geological report includes the groundwater elevation for the initial 12 bores peizometers. The report concluded that groundwater is greater than five (5) feet below land surface with exception of areas immediately adjacent to drainage features. A three dimension groundwater surface was created using these points which appeared adequate except through the erosion gulleys. Based on this surface, groundwater would be higher than the land surface across the gulleys. A second series of 7 piezometers were installed to a depth of approximately 10 feet in the low areas to provide data points necessary to establish a representative surface of the groundwater. There were also monitor locations established in the erosion gulleys to verify groundwater was not seeping through the erosion cutes. The dry ground surface of the monitoring points was used as the groundwater elevation. This is a conservation approach which would show groundwater at a higher elevation than actual conditions, therefore, providing a greater separation between groundwater and the disposal area bottom. The peizometer locations and groundwater information are shown in Figure 4-1 and Figure 4-2. The three dimensional surface established for the groundwater is on Sheet C-4 of the drawings. The surface was

used to design the disposal bottom area grades with a separation of at least 5 feet from the groundwater.

4.4 WATER WELL SURVEY

A water well survey was conducted within a one-mile radius of the site. The area is served by the public water system and no potable water wells were found.



MONITOR LOCATIONS FOR
ESTABLISHING GROUNDWATER ELEVATION

FIGURE 4-1

Pine Hollow Landfill
Supplemental Monitoring Locations
Groundwater Elevations

Groundwater depths in monitoring wells established groundwater elevations

Dry surface elevation at monitor locations established elevation above the groundwater elevation. If this elevation is used to determine the groundwater/disposal bottom separation, there will be a greater separation than the 5 feet.

Location No.	Monitor Type	Ground Elevation	Depth to Water	Height of Casing	Groundwater Elevation	Dry Surface Elevation
A-1	surface	347.83				347.83
A-2	surface	350.95				350.95
A-3	Piezometer	359.66	8.67	0.75	351.74	
A-4	Piezometer	376.97	9	1.5	369.47	
A-5	surface	358.33				358.33
A-6	surface	372.16				372.16
A-7	surface	394.49				394.49
A-8*	Piezometer	370.26	9.17	1	362.09	
A-9	Piezometer	395.02	9.5	0.42	385.94	
A-10	Piezometer	403.94	5.67	0	398.27	
A-11	Piezometer	394.01	8.83	1.75	386.93	
A-12	surface	378.37				378.37
A-13	Piezometer	408.72	4.75	1.67	405.64	

* No groundwater was encountered, used bottom of piezometer as depth to groundwater

FIGURE 4-2

Attachment 4-1

GEC

GEOTECHNICAL & ENVIRONMENTAL
CONSULTANTS, INC.

December 13, 2007

Mr. Craig Reaves
Reaves Wrecking Co., Inc.
18 Old Brick Yard Road
Phenix City, Alabama 36869

SUBJECT: **Report of Environmental Consulting Services**
Pine Hollow Landfill
Brickyard Road
Phenix City; Russell County, Alabama
GEC Project No.: CLE-07-1851

Dear Mr. Reaves:

Geotechnical and Environmental Consultants, Inc. (GEC) is pleased to present this report of Environmental Consulting Services performed at the above referenced site. The following report details our understanding of the project, the scope of work for the Environmental Consulting Services, and our conclusions relative to the work performed.

BACKGROUND

The subject site is an active construction/demolition landfill. Expansion of the landfill is planned on the 52± acres located along the northern boundary of the current landfill. A drainage feature crosses the site in a south to north orientation. The majority of the site is located to the west of the drainage feature, with a smaller portion being located to the east. As part of the design/application process, the depth to groundwater, below the existing ground surface, is required.

SCOPE OF WORK

The scope of work for this project consisted of the installation of twelve (12) soil borings, with Type I monitoring wells (piezometers) being installed into the borings upon their completion. The

514 Hillcrest Industrial Blvd. Macon, GA 31204 Tel: (478) 757-1606 Fax: (478) 757-1608
6202 West Hamilton Park Drive Columbus, GA 31909 Tel: (706) 569-0008 Fax: (706) 569-0940
6810 Chapel Glen Court Atlanta, GA 30360 Tel: (770) 804-9055

piezometers were installed to assist in determining the depth to groundwater below the existing ground surface at the site.

On October 29 and 30, 2007, GEC supervised the installation of twelve (12) subsurface borings, to facilitate the installation of Type I monitoring wells (piezometers) at the site. The soil borings were advanced by a track mounted CME-45 drill rig utilizing 4.25-inch hollow stem augers (HSA). The borings were advanced to varying depths below the ground surface. The soils were logged in the field based on drilling cuttings, supplemented by samples collected using a split spoon sampler. Termination depths for each of the borings are illustrated on Table 1, which is included as an attachment. Auger refusal was only encountered in two borings, B-3 (35 feet) and B-4 (22.5 feet).

Upon completion of each boring, a Type I monitoring well was installed in the borehole. The piezometers were screened along the lowermost ten feet using 0.010-inch slotted, 2-inch ID, schedule 40 PVC screen, with 2-inch ID, schedule 40 PVC risers to the surface. The annular space around each screen was filled with graded quartz filter sand to varying depths above the top of the screen. A bentonite seal was emplaced in the boring annulus on top of each filter pack.

Groundwater readings, the first of which were collected approximately 16 hours after the last piezometer was installed, are illustrated on Table 1, which is included as an attachment to this report. Groundwater depths ranged from 11.00 feet to 26.70 feet below the existing ground surface (BGS), with the shallowest groundwater depth being recorded in piezometer B-12 (11.00 feet BGS). Assumed groundwater elevations (based on estimated ground surface elevations, as obtained from the topographic contours in the area of each boring/piezometer as shown on the site plan) for each boring/piezometer are also included on Table 1.

After their completion, the locations of the piezometers were collected utilizing a map grade GPS (Trimble Pathfinder ProXH). The locations were then imported into an electronic plan of the site (provided by Hatch Mott MacDonald). Due to the lack of sufficient match points in the field, the locations of the borings on the plan should be considered approximate. A copy of the plan is provided as an attachment (Figure 2) to this report.

CONCLUSIONS

Based on the data collected at the site, groundwater was not encountered within five feet of the existing ground surface in any of the borings/piezometers installed at the site. Based on lithologic and other considerations, groundwater is not anticipated within five feet of the existing ground surface, with the possible exception of the areas around borings B-8 and B-12 (and other areas of similar elevation). These borings are located in or immediately adjacent to drainage features, which may, during seasons of high rainfall, exhibit groundwater at depths shallower than five feet below the existing ground surface. Although it is expected that groundwater levels are suppressed at the time of our evaluation, based on our experience, it is not anticipated that groundwater levels are within 5 feet

of the ground surface, except as noted above. Monitoring of the groundwater levels in the piezometers, over time, would be necessary to document this.

CLOSURE

GEC appreciates the opportunity to provide our professional services to you. If you have any questions concerning this report, or if we can be of further assistance, please feel free to contact our office.

Sincerely,
GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS, INC.

Kevin R. Strumpler, P.G.
Senior Geologist
AL Reg. No.: 1064

Elonzo F. Sharpe, Jr., P.E.
Senior Engineer
AL Reg. No.: 25515

KRS/EFS/krs

cc: Roger Moore, Hatch Mott MacDonald

Attachments: Site Location Map (Figure 1)
Boring Location Plan (Figure 2)
Groundwater Data (Table 1)
Boring Logs

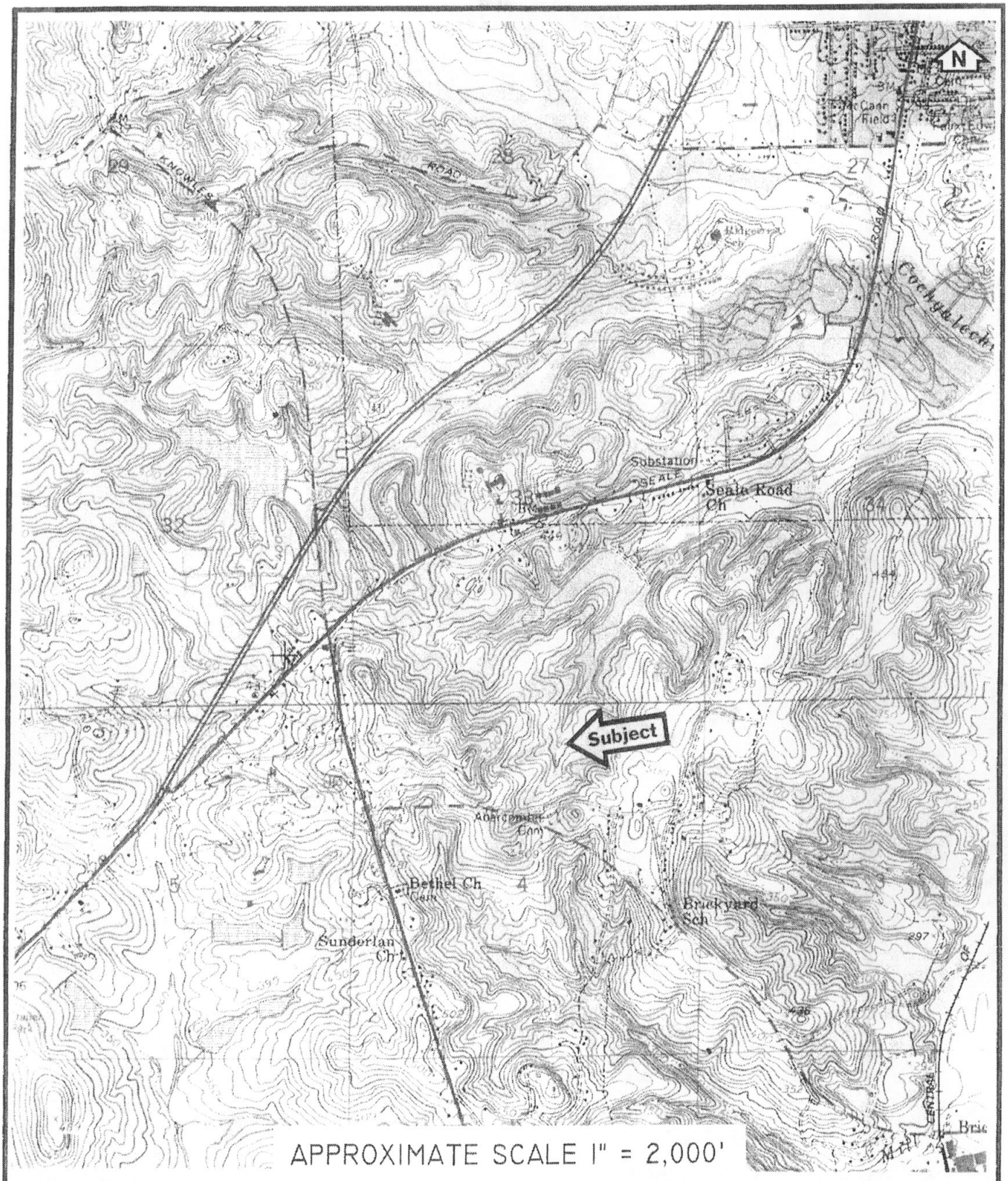
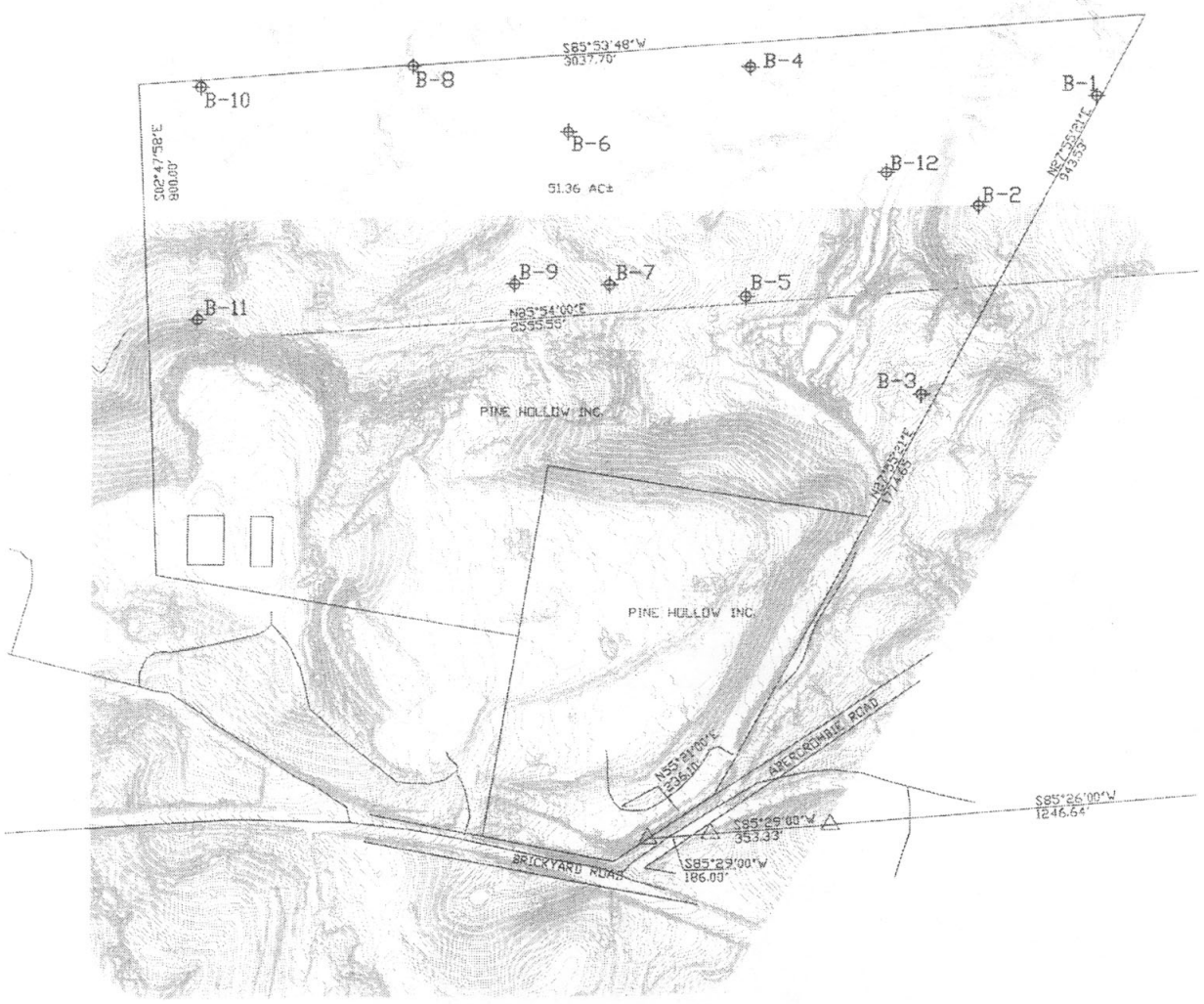


FIGURE 1
SITE LOCATION MAP
PINE HOLLOW LANDFILL
BRICKYARD ROAD
PHENIX CITY, ALABAMA
GEC PROJECT NO.: CLE-07-1815

GEC
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.



N

APPROXIMATE SCALE 1" = 365'

FIGURE 2
BORING LOCATION PLAN
PINE HOLLOW LANDFILL
BRICKYARD ROAD
PHENIX CITY, ALABAMA
GEC PROJECT NO.: CLE-07-1815

B-11 = Approximate Location of Boring

GEC
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.

PINE HOLLOW LANDFILL
BRICKYARD ROAD
PHENIX CITY, RUSSELL COUNTY, ALABAMA
GEC PROJECT NO.: CLE-07-1815A

TABLE 1
GROUNDWATER DATA

Boring/Well ID	Date	Estimated Ground Surface Elevation*	Depth to Groundwater (Below the Ground Surface)	Estimated Groundwater Elevation
B-1	10/31/07	415	14.79	400
	11/2/07		15.05	400
	11/13/07		15.17	400
B-2	10/31/07	402	17.98	384
	11/2/07		18.00	384
	11/13/07		18.17	384
B-3	10/31/07	401	19.15	382
	11/2/07		18.95	382
	11/13/07		18.95	382
B-4	10/31/07	395	18.48	377
	11/2/07		18.18	377
	11/13/07		18.53	376
B-5	10/31/07	400	21.83	378
	11/2/07		19.37	381
	11/13/07		19.13	381
B-6	10/31/07	421	22.55	398
	11/2/07		NS	NA
	11/13/07		22.52	398
B-7	10/31/07	430	NM	NA
	11/2/07		NS	NA
	11/13/07		26.70	403
B-8	10/31/07	368	11.35	357
	11/2/07		11.30	357
	11/13/07		11.47	357
B-9	10/31/07	443	NM	NA
	11/2/07		NM	NA
	11/13/07		NM	NA
B-10	10/31/07	406	NM	NA
	11/2/07		22.07	384
	11/13/07		22.77	383
B-11	10/31/07	469	25.57	443
	11/2/07		25.67	443
	11/13/07		25.80	443
B-12	10/31/07	369	14.92	354
	11/2/07		11.00	358
	11/13/07		11.16	358

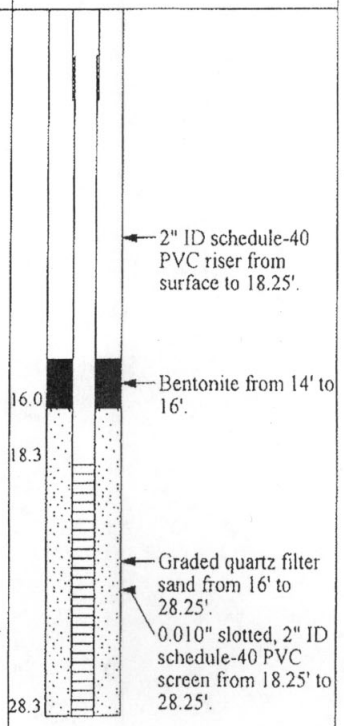
NM = none measured
NS = not sampled
* Estimated ground surface elevations are based on topographic contours in the area of each boring as shown on the site plan.

MONITORING WELL RECORD

Project: **Pine Hollow** Phenix City, Alabama	Well No: **B-1**
	Project No: CLE-07-1815
Location:	GS Elevation:
Driller/Equipment: GEC/ CME-55 w/HSA	Drilling Date: October 29, 2007
Water Level: 15.2 ft after 48+ hours	Engineer/Geologist:

Depth (ft)	Soil Description	Sample Type	N-Value	PID (ppm)
	brown, sandy **CLAY (CL)**			
	orange, sandy **CLAY (CL)**			
10	red-grey, **CLAY (CL)**			
	red, fine, clayey **SAND (SC)**			
20				
	red-grey, silty **CLAY (CL)**			
30	**BORING TERMINATED AT 30.0ft**			
40				

Well Diagram



- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES:

ENVIRONMENTAL CLE-07-1815A PINE HOLLOW.GPJ GEC.GDT 12/12/07

514 Hillcrest Industrial Blvd., Macon, GA 31204
5031 Milgen Court, Columbus, GA 31907

GEC
GEOTECHNICAL & ENVIRONMENTAL
CONSULTANTS

MONITORING WELL RECORD

Project: **Pine Hollow** Phenix City, Alabama	Well No: **B-2**
	Project No: CLE-07-1815
Location:	GS Elevation:
Driller/Equipment: GEC/ CME-55 w/HSA	Drilling Date: October 29, 2007
Water Level: 18.2 ft after 48+ hours	Engineer/Geologist:

Depth (ft)	Soil Description	Sample Type	N-Value	PID (ppm)
	COASTAL PLAIN orange, fine, silty **SAND (SM)**			
10	orange, medium to fine, clayey **SAND (SC)**			
20	dark orange, medium to fine, clayey **SAND (SC)**			
30	**BORING TERMINATED AT 30.0ft**			
40				

Well Diagram:

- 2" ID schedule-40 PVC riser from surface to 15.75'.
- 13.0 — Bentonite from 11' to 13'.
- 15.8 — Graded quarz filter sand from 13' to 25.75'.
- 0.010" slotted, 2" ID schedule-40 PVC screen from 15.75' to 25.75'.
- 25.8

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES:

ENVIRONMENTAL CLE-07-1815A PINE HOLLOW.GPJ GEC.GDT 12/12/07

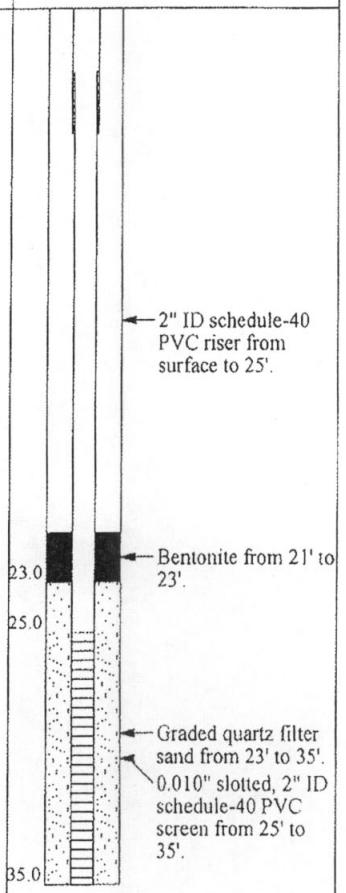
514 Hillcrest Industrial Blvd., Macon, GA 31204
5031 Milgen Court, Columbus, GA 31907

GEC
GEOTECHNICAL & ENVIRONMENTAL
CONSULTANTS

MONITORING WELL RECORD

Project: **Pine Hollow** Phenix City, Alabama	Well No: **B-3** Project No: CLE-07-1815
Location:	GS Elevation:
Driller/Equipment: GEC/ CME-55 w/HSA	Drilling Date: October 29, 2007
Water Level: 19.0 ft after 48+ hours	Engineer/Geologist:

Water Level (ft)	Depth (ft)	Soil Symbol	Soil Description	Sample Type	N-Value	PID (ppm)	Well Diagram
			COASTAL PLAIN				
			orange, fine, clayey **SAND (SC)**				
			multicolored, **CLAY (CL)**				
	10						
			dark grey, **CLAY (CL)**				
▼	20						
			dark grey, sandy **CLAY (CL)**				
	30						
			AUGER REFUSAL ENCOUNTERED AT 35.0ft				
	40						



- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES:

ENVIRONMENTAL CLE-07-1815A PINE HOLLOW.GPJ GEC.GDT 12/12/07

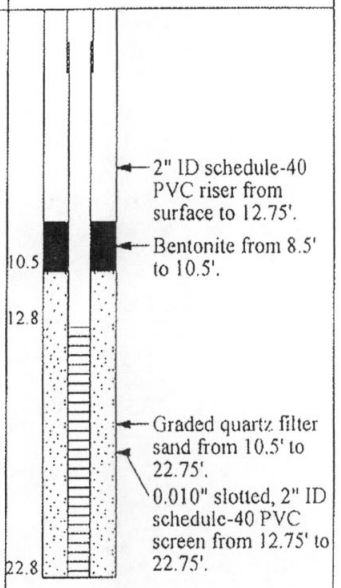
514 Hillcrest Industrial Blvd., Macon, GA 31204
5031 Milgen Court, Columbus, GA 31907

GEC
GEOTECHNICAL & ENVIRONMENTAL
CONSULTANTS

MONITORING WELL RECORD

Project: **Pine Hollow** Phenix City, Alabama	Well No: **B-4**
	Project No: CLE-07-1815
Location:	GS Elevation:
Driller/Equipment: GEC/ CME-55 w/HSA	Drilling Date: October 29, 2007
Water Level: 18.5 ft after 48+ hours	Engineer/Geologist:

Water Level (ft)	Depth (ft)	Soil Symbol	Soil Description	Sample Type	N-Value	PID (ppm)	Well Diagram
	10		red, sandy **CLAY (CL)**				
			red-grey, **CLAY (CL)**				
▼	20		dark grey, **CLAY (CL)**				
			AUGER REFUSAL ENCOUNTERED AT 22.5ft				
	30						
	40						



- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES:

ENVIRONMENTAL CLE-07-1815A PINE HOLLOW.GPJ GEC.GDT 12/12/07

514 Hillcrest Industrial Blvd., Macon, GA 31204
5031 Milgen Court, Columbus, GA 31907

GEC
GEOTECHNICAL & ENVIRONMENTAL
CONSULTANTS

MONITORING WELL RECORD

Project: **Pine Hollow** Phenix City, Alabama	Well No: **B-5**
	Project No: CLE-07-1815
Location:	GS Elevation:
Driller/Equipment: GEC/ CME-55 w/HSA	Drilling Date: October 30, 2007
Water Level: 19.1 ft after 48+ hours	Engineer/Geologist:

Depth (ft)	Soil Symbol	Soil Description	Sample Type	N-Value	PID (ppm)	Well Diagram
0		**COASTAL PLAIN**				
		tan, fine, silty **SAND (SM)**				
		red, **CLAY (CL)**				
		tan, **CLAY (CL)**				
10						2" ID schedule-40 PVC riser from surface to 13'. Bentonite from 9' to 11'. 11.0 13.0
20		dark grey, **CLAY (CL)**				Graded quartz filter sand from 11' to 23'. 0.010" slotted, 2" ID schedule-40 PVC screen from 13' to 23'. 23.0
		BORING TERMINATED AT 23.0ft				
30						
40						

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES:

ENVIRONMENTAL CLE-07-1815A PINE HOLLOW.GPJ GEC.GDT 12/12/07

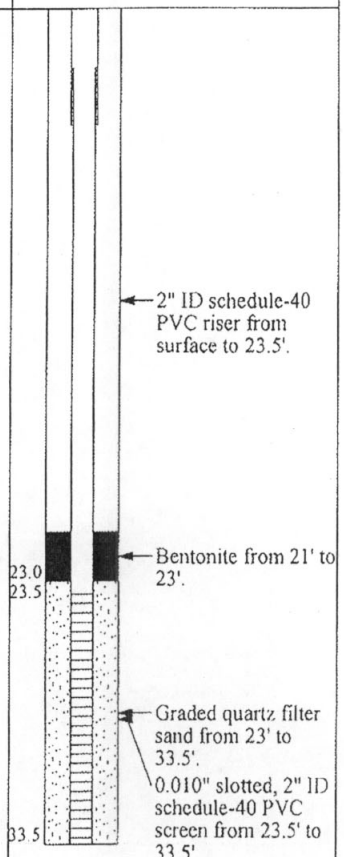
514 Hillcrest Industrial Blvd., Macon, GA 31204
5031 Milgen Court, Columbus, GA 31907

GEC
GEOTECHNICAL & ENVIRONMENTAL
CONSULTANTS

MONITORING WELL RECORD

Project: **Pine Hollow** Phenix City, Alabama	Well No: **B-6**
	Project No: CLE-07-1815
Location:	GS Elevation:
Driller/Equipment: GEC/ CME-55 w/HSA	Drilling Date: October 30, 2007
Water Level: 22.5 ft after 48+ hours	Engineer/Geologist:

Water Level (ft)	Depth (ft)	Soil Symbol	Soil Description	Sample Type	N-Value	PID (ppm)	Well Diagram
			tan, fine, silty **SAND**				
			orange, fine, silty **SAND**				
			brown, **CLAY**				
	10		multicolored, **CLAY**				
	20						
▼			dark grey, **CLAY**				
	30						
			BORING TERMINATED AT 33.5ft				
	40						



- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES:

ENVIRONMENTAL CLE-07-1815A PINE HOLLOW.GPJ GEC.GDT 12/12/07

514 Hillcrest Industrial Blvd., Macon, GA 31204
5031 Milgen Court, Columbus, GA 31907

GEC
GEOTECHNICAL & ENVIRONMENTAL
CONSULTANTS

MONITORING WELL RECORD

Project: **Pine Hollow** Phenix City, Alabama	Well No: **B-7**
	Project No: CLE-07-1815
Location:	GS Elevation:
Driller/Equipment: GEC/ CME-55 w/HSA	Drilling Date: October 30, 2007
Water Level: 26.7 ft after 48+ hours	Engineer/Geologist:

Water Level (ft)	Depth (ft)	Soil Symbol	Soil Description	Sample Type	N-Value	PID (ppm)	Well Diagram
			COASTAL PLAIN orange-red, **CLAY (CL)**				
	10		tan, **CLAY (CL)**				2" ID schedule-40 PVC riser from surface to 18'. Bentonite from 14' to 16'. 16.0 18.0 Graded quartz filter sand from 16' to 28'. 0.010" slotted, 2" ID schedule-40 PVC screen from 18' to 28'. 28.0
▼	20		dark grey, **CLAY (CL)**				
	30		**BORING TERMINATED AT 28.0ft**				
	40						

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES:

ENVIRONMENTAL CLE-07-1815A PINE HOLLOW.GPJ GEC.GDT 12/12/07

514 Hillcrest Industrial Blvd., Macon, GA 31204
5031 Milgen Court, Columbus, GA 31907

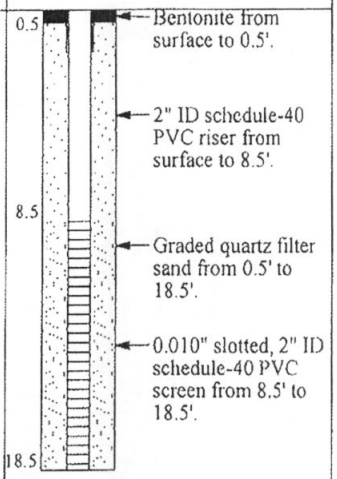
GEC
GEOTECHNICAL & ENVIRONMENTAL
CONSULTANTS

MONITORING WELL RECORD

Project: **Pine Hollow** Phenix City, Alabama	Well No: **B-8**
	Project No: CLE-07-1815
Location:	GS Elevation:
Driller/Equipment: GEC/ CME-55 w/HSA	Drilling Date: October 30, 2007
Water Level: 11.5 ft after 48+ hours	Engineer/Geologist:

Depth (ft)	Soil Symbol	Soil Description	Sample Type	N-Value	PID (ppm)
0		**COASTAL PLAIN**			
		reddish-orange, **CLAY (CL)**			
10		tan, fine, silty **SAND (SM)**			
20		**BORING TERMINATED AT 20.0ft**			
30					
40					

Well Diagram



- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES:

ENVIRONMENTAL CLE-07-1815A PINE HOLLOW.GPJ GEC.GDT 12/12/07

514 Hillcrest Industrial Blvd., Macon, GA 31204
5031 Milgen Court, Columbus, GA 31907

GEC
GEOTECHNICAL & ENVIRONMENTAL
CONSULTANTS

MONITORING WELL RECORD

Project: **Pine Hollow** Phenix City, Alabama	Well No: **B-9**
	Project No: CLE-07-1815
Location:	GS Elevation:
Driller/Equipment: GEC/ CME-55 w/HSA	Drilling Date: October 30, 2007
Water Level: ---	Engineer/Geologist:

Depth (ft)	Soil Symbol	Soil Description	Sample Type	N-Value	PID (ppm)	Well Diagram
		COASTAL PLAIN				
		tan, fine, silty **SAND (SM)**				
		red-grey, **CLAY (CL)**				
10						2" ID schedule-40 PVC riser from surface to 22.75'.
20		dark grey, **CLAY (CL)**				Bentonite from 18.5' to 20.5'. (20.5)
		dark grey, sandy **CLAY (CL)**				(22.8)
		dark grey, **CLAY (CL)**				Graded quartz filter sand from 20.5' to 32.75'.
30						0.010" slotted, 2" ID schedule-40 PVC screen from 22.75' to 32.75'. (32.8)
		BORING TERMINATED AT 32.5ft				
40						

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES:

ENVIRONMENTAL CLE-07-1815A PINE HOLLOW.GPJ GEC.GDT 12/12/07

514 Hillcrest Industrial Blvd., Macon, GA 31204
5031 Milgen Court, Columbus, GA 31907

GEC
GEOTECHNICAL & ENVIRONMENTAL
CONSULTANTS

MONITORING WELL RECORD

Project: **Pine Hollow** Phenix City, Alabama	Well No: **B-10**
	Project No: CLE-07-1815
Location:	GS Elevation:
Driller/Equipment: GEC/ CME-55 w/HSA	Drilling Date: October 30, 2007
Water Level: 22.8 ft after 48+ hours	Engineer/Geologist:

Water Level (ft)	Depth (ft)	Soil Symbol	Soil Description	Sample Type	N-Value	PID (ppm)	Well Diagram
			COASTAL PLAIN tan, fine, silty **SAND (SM)**				
	10		brown, silty **CLAY (CL)**				2" ID schedule-40 PVC riser from surface to 23.5'.
	20		tan, **CLAY (CL)**				Bentonite from 19.5' to 21.5'. (21.5)
▼	30		dark grey, **CLAY (CL)**				(23.5) Graded quartz filter sand from 21.5' to 33.5'. 0.010" slotted, 2" ID schedule-40 PVC screen from 23.5' to 33.5'. (33.5)
	40		**BORING TERMINATED AT 33.5ft**				

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES:

ENVIRONMENTAL CLE-07-1815A PINE HOLLOW.GPJ GEC.GDT 12/12/07

514 Hillcrest Industrial Blvd., Macon, GA 31204
5031 Milgen Court, Columbus, GA 31907

GEC
GEOTECHNICAL & ENVIRONMENTAL
CONSULTANTS

MONITORING WELL RECORD

Project: **Pine Hollow** Phenix City, Alabama	Well No: **B-11**
	Project No: CLE-07-1815
Location:	GS Elevation:
Driller/Equipment: GEC/ CME-55 w/HSA	Drilling Date: October 30, 2007
Water Level: 25.8 ft after 48+ hours	Engineer/Geologist:

Water Level (ft)	Depth (ft)	Soil Symbol	Soil Description	Sample Type	N-Value	PID (ppm)	Well Diagram
			COASTAL PLAIN tan, fine, silty **SAND (SM)**				2.0 ← Bentonite from surface to 2'.
▼	10 20		tan, **CLAY (CL)**				← 2" ID schedule-40 PVC riser from surface to 23'. ← Graded quartz filter sand from 2' to 33'.
	30		dark grey, **CLAY (CL)**				23.0 ← 0.010" slotted, 2" ID schedule-40 PVC screen from 23' to 33'.
	40		**BORING TERMINATED AT 33.0ft**				33.0

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES:

ENVIRONMENTAL CLE-07-1815A PINE HOLLOW.GPJ GEC.GDT 12/12/07

514 Hillcrest Industrial Blvd., Macon, GA 31204
5031 Milgen Court, Columbus, GA 31907

GEC
GEOTECHNICAL & ENVIRONMENTAL
CONSULTANTS

MONITORING WELL RECORD

Project: **Pine Hollow** Phenix City, Alabama	Well No: **B-12** Project No: CLE-07-1815
Location:	GS Elevation:
Driller/Equipment: GEC/ CME-55 w/HSA	Drilling Date: October 30, 2007
Water Level: 11.2 ft after 48+ hours	Engineer/Geologist:

Water Level (ft)	Depth (ft)	Soil Symbol	Soil Description	Sample Type	N-Value	PID (ppm)	Well Diagram
▼	10		**ALLUVIUM** tan, fine, silty **SAND (SM)**				2.0 ← Bentonite from surface to 2'. ← 2" ID schedule-40 PVC riser from surface to 5'. 5.8 ← Graded quartz filter sand from 2' to 15.75'. ← 0.010" slotted, 2" ID schedule-40 PVC screen from 5.75' to 15.75'. 15.8
			COASTAL PLAIN tan-grey, **CLAY (CL)**				
	20		**BORING TERMINATED AT 15.0ft**				
	30						
	40						

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES:

ENVIRONMENTAL CLE-07-1815A PINE HOLLOW.GPJ GEC.GDT 12/12/07

514 Hillcrest Industrial Blvd., Macon, GA 31204
5031 Milgen Court, Columbus, GA 31907

GEC
GEOTECHNICAL & ENVIRONMENTAL
CONSULTANTS

5.0 SITING STANDARDS

Section 5.0 addresses the siting standards outlined in ADEM Administrative Code R.335-13-4-0.1. Compliance with these standards is required in order to prevent adverse effects on health or the environment. The landfill complies with all the sitting standards as described in the following paragraphs.

5.1 FLOODPLAIN

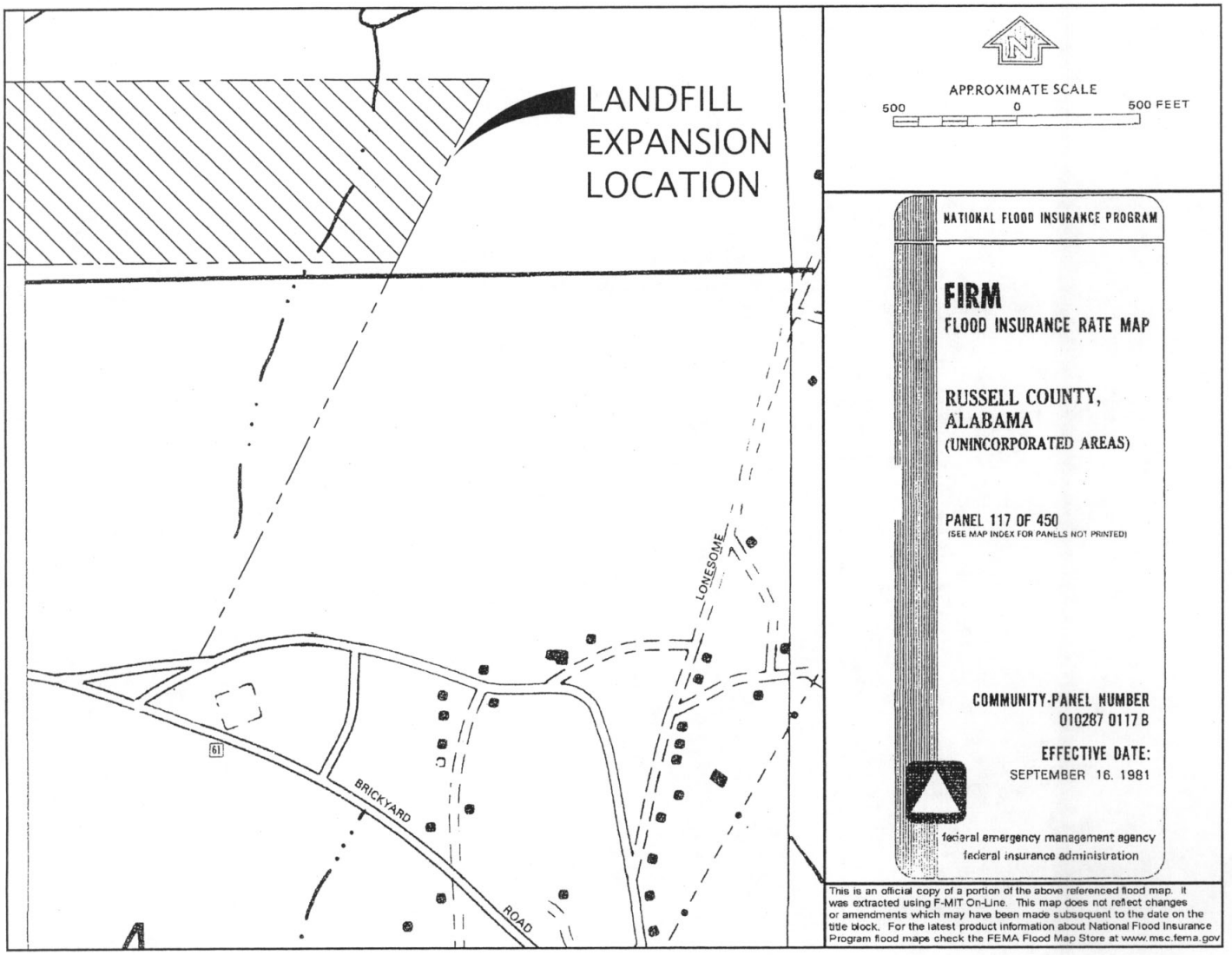
The site is not located within the 100-year flood boundary as defined by the Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM). The applicable portion of this map with site location is shown in Figure 5-1.

5.2 ENDANGERED OR THREATENED SPECIES

A survey of endangered or threatened species in the area of the landfill expansion was conducted July 9, 2008 by Dr. F.O. Bingham, Environmental Consultant. Dr. Bingham performed the survey and prepared a report of his findings which is included in Appendix A. The report indicates that endangered or threatened species were not found on the landfill site.

5.3 WATER QUALITY

In accordance with EPA 40 CFR 122.26 and conversations with ADEM, an inert landfill is not required to have a National Discharge Elimination system (NPDES) permit to operate. However, an inert landfill must obtain a NPDES permit for construction. Since the landfill will be under construction until closure, the NPDES construction permit will



KEY TO MAP

500-Year Flood Boundary	ZONE B
100-Year Flood Boundary	ZONE A2 DATE / ZONE A1 DATE
Zone Designations* With Date of Identification e.g., 12/2/74	
100-Year Flood Boundary	
500-Year Flood Boundary	ZONE B
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7 ×
River Mile	• M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

PINE HOLLOW LANDFILL EXPANSION
RUSSELL COUNTY, ALABAMA
FLOODPLAIN LOCATION MAP
FIGURE 5-1

P:\237654CE01 Reaves - Pine Hollow Landfill\Drawings\Civil\FIGURE 5-1.dwg, 10/30/2008 11:44:08 AM

be required throughout its life. The NPDES permit will be acquired for storm water discharges occurring during construction of the landfill.

The landfill will be constructed and operated in a manner that will protect the ground and surface water resources. Sources of non-point pollution will be mitigated by the use of best management practices, such as silt fences, straw bales, vegetative covers, diversion structures and sediment control structures.

5.4 WETLANDS

A jurisdictional delineation of wetlands in the area of the Pine Hollow Landfill expansion was performed by Dr. Frasier Bingham, Environmental Consultant. A copy of the report of findings is included in Appendix A. The report states that no wetlands are present at the landfill.

5.5 GROUNDWATER OR BEDROCK SEPARATION

A three dimensional groundwater surface was created in the area of the landfill expansion. This surface provided the data necessary to maintain a minimum separation of five feet from the ground water to the bottom elevations of the disposal area. Contours of the groundwater and the disposal area expansion bottom grades are shown on Sheet C-4 of the drawings.

5.6 AIRPORTS

The landfill is not located within five miles of any known airport runway. Also, putrescible waste which may attract birds is not disposed of at the landfill; therefore, operations would not pose a bird hazard to aircraft.

5.7 ZONES OF ACTIVE FAULTS, SINKHOLES, AND KARST TERRAIN

Based on a literature review, there are no known active faults within a one mile radius of the perimeter of the site. Subtitle D rules define a seismic impact zone as an area with a 10 percent or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as a percentage of the earth's gravitational pull (g), will not exceed 0.10g in 250 years. According to the 1992 (revised) Aggression Map (referenced in the U.S. EPA's guidance for solid waste disposal facility criteria), the site lies within an area with a maximum horizontal acceleration of less than 0.9g. Therefore, the site does not lie within a seismic impact zone.

Karst features, such as sinkholes, have not been identified within the vicinity of the site.

5.8 ARCHAEOLOGICAL OR HISTORICAL SIGNIFICANCE

A cultural resource survey was conducted by TRC in the area of landfill expansion. The survey report, which is included in Appendix B, states that no new archeological sites or historic architectural resources were identified in the area of potential impact for the landfill expansion. The report also states that there were no findings eligible for the HRHD and recommends no further cultural resource investigations in advance of the expansion. Also attached is a letter from the Alabama Historic Commission stating that the current site has no effect on cultural resources. The expanded area is adjacent and similar to the current site.

6.0 GENERAL DESIGN STANDARDS

6.1 FINAL GRADING

The final grading plan for the expansion is similar to the existing grades of active disposal operations which have performed satisfactorily. The final grade of the landfill will have a maximum side slope of 25 percent (4H:IV) and a minimum top slope of 5 percent. Horizontal terraces will be constructed for every 20 foot rise in elevation. Each terrace will be constructed with a minimum 15 foot wide bench.

The side slope terraces are designed to provide stability during closure of the landfill, to control the flow of runoff, provide access for maintenance and operation, and to trap sediment.

A typical section of the side slope and terrace is shown in the Permit Drawings (Drawing C-7).

6.2 FINAL CAP SYSTEM

The landfill cap is designed to reduce erosion and minimize subsurface ponding within the disposal area. To reduce the subsurface ponding, the permeability of the cap will be less than or equal to the disposal area base soil.

The cap consists of an erosion layer underlain by an infiltration layer.

6.2.1 Infiltration Layer

The infiltration layer minimizes infiltration through the landfill cap. This layer will be a minimum of 18 inches in thickness and also serves as a base to the erosion layer. The infiltration layer will be comprised of compacted earthen material excluding sand.

6.2.2 Erosion Layer

The erosion layer protects the landfill cap from wind and water erosion, increases evaoptranspiration, and provides an aesthetically pleasing atmosphere. This layer will consist of a minimum of 6 inches of topsoil and vegetation. The top soil will be a material that is capable of sustaining native plant growth. The design objectives for the vegetation include: draught resistance, shallow (less than 6 inches) and strong rooted, and low maintenance.

6.3 LEACHATE

Leachate, as defined by ADEM Administrative Code 335-13-1, is liquid which percolated through or emerged from solid waste. The characteristics of the leachate are dependent on the type of waste from which it was generated. The landfill is designed to minimize stormwater contact with waste through the use of a narrow working face. The stormwater which falls on the working face will either run off or migrate into the waste. Technically, this runoff can be considered leachate; however, the waste disposed of is construction and demolition debris and foundry sand which creates a leachate that is basically clean and would not pose a threat to human health or the environment. Therefore, leachate collection, removal, and treatment are not considered applicable to this site. Also, it is requested that the landfill be exempt from the groundwater monitoring requirements.

6.4 STORMWATER

The runoff from a 25-year, 24-hour storm will be controlled by the use of berms, ditches, and temporary sedimentation ponds. Berms, ditches, and disturbed areas will be grassed to reduce erosion and siltation. Silt fencing and straw bales may also be used as needed.

6.4.1 Run-On

Stormwater flowing towards the disposal area is intercepted by perimeter ditches. The perimeter ditches will route the stormwater to sedimentation ponds.

6.4.2 Run-Off

The disposal area operations will be upgradient so that run-off will be away from the waste. Temporary sedimentation ponds are proposed downgradient of operations. The siltation control during the final phase of operations will be accomplished through the use of silt fences and hay bales.

As the disposal operations extend above the natural ground, silt fences or hay bales will be used for silt and erosion control until vegetation is established on the final grades. Silt fences will be used, as a minimum, at the toe of slope for the area fill. Should erosion continue to occur on the final slopes after vegetation is established, drainage ways will be constructed with locking blocks or rip rap for routing the run-off down the slopes.

6.5 ACCESS ROAD

An all weather access road will be constructed to the active disposal area and dumping face. The road will be constructed with base material (see Drawing C-7). The landfill equipment operator shall assist should difficulties be encountered.

6.6 EXPLOSIVE GAS

Some of the construction and demolition waste disposed of at the site will decay and produce gas. The anticipated rate of gas production will be low as compared to gas produced from putrescible waste. Because of the anticipated low production rate, collection of gas for use as a fuel is not being considered.

Methane gas will generally migrate upwards (lighter than air) along the path of least resistance; however, barriers can cause gas to migrate laterally. The landfill cap should not become a barrier as it is permeable; however, if gas did migrate along the cap, it would exit the side slopes of the disposal area. Gas migrating within the waste and below the surrounding surface has the greater possibility of migrating off-site. Structures located on the facility (personnel facilities, storage sheds, etc.) are susceptible to gas accumulation and will be adequately ventilated to prevent gas accumulation. Gas monitoring points will be established to ensure that gas above the allowable limits is not migrating off-site or accumulating within structures. Should areas of distressed vegetation be encountered during operations or post closure, the area will be investigated for the presence of gas. If gas is detected, which is above 25 percent of the lower explosive limit, ADEM will be notified and a venting system will be installed as needed.

6.6.1 Gas Control

Gas generation at the Pine Hollow inert landfill is expected to be minimal. Gas which is generated should move upwards and pass through the cap. The volume of gas should not be enough to harm the vegetation. Should areas of distressed vegetation be encountered in the closed disposal area, gas vents will be installed. The gas vents will provide access for the gas to enter the atmosphere without contacting the vegetation. A typical gas vent is shown on Drawing C-7.

6.6.2 Gas Monitoring

An explosive gas monitoring plan is presented to ensure that gas migration does not create hazardous conditions or migrate off-site at explosive levels. At a minimum, gas will be monitored annually at the landfill boundaries and at structures.

Permanent gas test stations are proposed along the landfill boundary with a 300 foot maximum separation, except where the boundary is within 1,000 feet of a dwelling, then they will be placed at a 100-foot maximum separation. Details of the test stations and their locations are shown on Drawing C-7. Each test station will be marked with its preassigned identifying number.

Structures located at the landfill which included personnel facilities, storage sheds, drainage culvers, etc., will also be monitored for gas. Monitoring will be conducted in the same general location on each occasion. The location of the testing will be included in the gas monitoring report.

Explosive gas monitoring will be conducted at least once a year. Monitoring will be performed at all test stations and in, under and around all structures with a gas meter provided or made available by Pine Hollow, Inc. Levels of gas detected will be expressed

in percent of the lower explosive limit (LEL) and percent volume. Gas meters indicating either percent LEL or percent volume will be used, and the conversion for reporting will be based on the LEL of gas at five percent by volume in air. Also, a visual inspection of the general area will be conducted to detect conditions (distressed vegetation) that indicate gas migration. Should areas of distressed migration be observed, actions will be taken to determine if gas is present and, if so, to prevent migration to the landfill boundary.

Explosive gas concentrations shall not exceed the LEL at the landfill boundary or 25 percent LEL in a facility structure. If gas concentrations have not been exceeded, the gas monitoring reports shall be submitted to the department within 30 days of the monitoring event. The monitoring report shall include date, weather conditions, equipment used, results for each monitoring point, description of test point in or around structures, name of person performing the testing and other information which may be useful.

If monitoring results show that the explosive concentration exceeds the lower explosive limit at the facility boundary, or 25 percent of the lower explosive limit in facility structures, then the Owner will proceed with the following steps:

1. Action to ensure immediate protection of human health and property.

2. Immediately notify ADEM of the explosive gas levels detected and immediate steps taken to protect human health and property.

3. A remedial plan for explosive gas releases will be submitted to ADEM within 20 days describing the nature and extent of the problem and the proposed remedy. The plan will be implemented following approval by ADEM.

During the monitoring operations, "No Smoking" rules will be observed.

7.0 OPERATIONAL PLAN

7.1 LANDFILL CONCEPT

The Pine Hollow Landfill expansion will be constructed and operated in the same manner as the existing disposal area. As landfill operations allow, the landfill will be expanded to include the new expansion area and by additional phases progressing towards the north and west.

In addition to the disposal operations, unused portions of the disposal area will continue to be used for composting. The compost operations include stockpiling selected rubbish (i.e., leaves, trimmings) in 5 to 8 feet high rows. After the rubbish decomposes, it will be used to create a material suitable to support a vegetative growth and used in the final cap.

Broken concrete and brick may be stock piled in separate location within the disposal boundaries away from the active disposal area. Broken concrete waste will be used as rip-rap when needed for erosion control. An unused portion of the disposal area will also be used for storing the rip-rap.

7.2 SITE ACCESS

The road entering the site will be restricted by a gate which will be opened and attended to as needed. The boundaries of the site will be fenced except where natural barriers exist to prevent unauthorized access.

7.3 BUFFER ZONE

A 100-foot minimum buffer zone has been established around the site. Existing trees within the buffer zone will be undisturbed, except where roads, ditches, and other operational features require clearing. No disposal or storage practices for waste shall take place within the buffer zone.

7.4 ACCEPTED WASTE

The Pine Hollow Landfill accepts wastes from the Reaves Wrecking Company LLC, Pine Hollow operations, the public and commercial haulers. These wastes are non-hazardous and non-putrescible and include construction and demolition waste, trees, limbs, stumps, fiberglass insulation debris foundry sand for cover material and used tires. The TCLP analysis for the foundry sand will be submitted to the Department with a Solid/Hazardous Waste Determination form annually, or when feeder stock changes.

Construction and demolition waste includes waste building materials, packaging, and rubble resulting from construction, remodeling, repair, or demolition operations on pavements, houses, buildings, and other structures. Such waste includes, but is not limited to, masonry materials, sheetrock, roofing waste, insulation (excluding asbestos), rebar, scrap metal, paving materials, and wood products.

Waste containers larger than 10 gallons, which are capable of holding liquids, will not be accepted unless they have been rendered unsuitable for holding liquids prior to delivery to the disposal facility. Bulk on non containerized liquid waste will also not be accepted at the landfill.

7.5 ACCEPTED WASTE CONTROL

7.5.1 Waste Inspections

The landfill accepts waste which is recieved from the Reaves Wrecking Company, Pine Hollow operations, the public and commercial haulers. Waste taken to the landfill will be periodically inspected with emphasis placed on waste received from the public.

The waste inspections are conducted by the Pine Hollow waste handling personnel for detecting and preventing the disposal of on-permitted wastes which include, but not limited to, free liquids, hazardous wastes, medical wastes, and PCB wastes. Records of inspections include as a minimum description of waste, size of load, date, time of day, and name of driver delivering waste. The records will be maintained on file.

Wastes inspected for delivery to the landfill which are prohibited under the terms of the permit, or which are suspected to be hazardous, will not be placed in the landfill. If, upon further investigation, it is determined that the material is a hazardous waste, it shall be handled and disposed of as required by the applicable ADEM and EPA hazardous waste regulations.

7.5.2 Discovery of Non-Permitted Waste

If it is suspected or discovered that, in spite of the foregoing procedures, hazardous wastes have been placed in the landfill, an investigation will be conducted immediately. If investigations by Pine Hollow confirm that hazardous wastes have been placed in the landfill, ADEM shall be notified by telephone, followed by confirmation in writing. Said

materials shall be removed and properly handled and disposed of according to applicable regulations.

7.6 MEASURING OR WEIGHING DEVICE

The measurement of all waste disposal at the site will be estimated or measured by truck or trailer bed size. Should the transportation vehicle not be full, the volume will be adjusted proportionally.

7.7 SIGN

A sign will be posted at the landfill which states the following:

1. Name of permittee
2. Name of owner
3. Name of Landfill
4. Days and hours of operation
5. Waste types accepted
6. Disposal fees.

7.8 DAILY OPERATIONS (UNLOADING AND COMPACTING

All waste transportation vehicles entering the site will be directed to the disposal area. The waste will be unloaded at the toe of the active working face. The waste will then be spread up and over the working face to a depth of approximately 2 feet. The working face will be confined to as small an area as possible and at a slope of approximately 4 to 1 (25 percent). During the spreading process, the equipment operator will attempt to mix and place the various types of wastes so that greater compaction of the wastes can be

achieved. The operator will compact each layer of waste by making two to five passes over the waste with the landfill equipment.

7.9 WEEKLY COVER

A minimum of six inches of compacted earth or other alternative cover material approved by ADEM will be placed over the waste from one week's operation. Should odors, vectors or litter become a problem or for ease of operations, the landfill operator may elect to place the cover material on the top and side of the waste periodically during the week.

Weekly cover material will be obtained on-site from areas of proposed excavation or from off-site borrow pits. Clean foundry sand may also be used for cover material.

7.10 STORMWATER MANAGEMENT

Stormwater runoff from a 25-year, 24-hour storm will be controlled through the use of berms, temporary sedimentation ponds, and by best management practices (i.e., silt fences, hay bales, etc.).

The temporary sedimentation ponds will detain the runoff volume from a 25-year, 24-hour storm from within the active, disposal area. The pond includes a silt fence for controlling siltation. The only operational activity associated with the pond is periodic cleaning and replacing the silt fence.

The siltation will be controlled on areas of fill above ground by silt fences placed at the toe of slope. The silt fences will be cleaned and replaced as needed until the final grades and vegetation are established.

7.11 ADVERSE WEATHER

Landfill equipment will assist vehicles, if needed, during periods of adverse weather.

7.12 SCAVENGING

Scavenging will be prohibited at the landfill. Salvaging or recycling operations will be conducted prior to placement of the waste in the disposal area. A rip rap holding area will be used where broken concrete, brick, and rock can be stored until they are needed.

7.13 EQUIPMENT

The equipment used for the landfill construction and operation will vary for the various activities. The following equipment will be made available as needed:

1 Bulldozer
1 Dump Truck
1 Excavator
1 Pick-up Truck
Miscellaneous Tools, Pumps, etc.

7.14 VECTOR CONTROL

Vectors are unlikely to be a problem as putrescible waste is not disposed of in the landfill. Vectors will be further controlled by compaction and the use of cover. Should there be a problem with vectors, the appropriate measures to control them will be taken.

7.15 LITTER CONTROL

Litter will be controlled along the entrance, access roads, and within the confines of the facility by policing. Wind blown litter will be reduced by limiting the size of the active working face, containment berms, and cover. Based on the type of waste disposal at the landfill, litter is not expected to be a problem.

7.16 FIRES

7.16.1 Fire Control

Everyone is to be alert for conditions that can encourage fire. Should a fire occur in the landfill waste, initial attempts to extinguish the fire will be by smothering the ignited waste with soil. Extinguishing the fire with water will be used as a last resort.

7.16.2 Open Burning

Open burning at the landfill will be prohibited with exception of on-site clearing debris, such as trees and stumps. The burning shall not occur over previously filled areas or within 200 feet of existing disposal operations. Prior to burning, approval shall be obtained from ADEM and other appropriate authorities.

7.17 PERSONNEL

Pine Hollow waste handling personnel will be responsible to assure that operations at the facility are performed in accordance with the operational plan and ADEM regulations. They will also inspect all waste, record the quantity, and be responsible for operations of the stormwater structures and the general operations of the site. Equipment operators will be responsible for the earthwork, waste placement and compaction, cover operations, and maintenance of structures and the access road.

7.18 PERSONNEL FACILITIES

Personnel facilities will be provided at the site which includes shelter, communications, lavatory, and toilet. The facilities will be kept clean and in good working conditions.

7.19 RECORDS

Records will be maintained on the daily volume of waste received at the landfill. A quarterly report, utilizing a format approved by ADEM which summarizes the daily volume, will be submitted to ADEM and maintained on file.

8.0 CLOSURE AND POST-CLOSURE PLAN

8.1 CLOSURE

The landfill closure is an ongoing process which will be implemented during the active life of the landfill, with exception of the final disposal area which will obviously be closed thereafter. As areas of the landfill reach the final elevations, the cap will be placed over the waste, graded, and vegetated.

8.1.1 Final Cap

The final cap design consists of an 18-inch infiltration layer, a 6-inch layer of topsoil, and vegetation. A typical section of the final cap design is included in the Permit Drawings.

The soil for the infiltration layer will be obtained from the excavated material stockpiled during the development of the landfill and from off-site borrow pits, if needed. The top soil will be obtained from an off-site source or by mixing mulch from the compost operations with material stockpiled.

8.1.2 Grade (5 Percent – 17 Percent)

As different phases of the landfill are closed, grades will be developed according to the final grading plan (see Drawing C-6). Final contours shown are approximations and are intended as a general guide. If significant changes become necessary to the final grading plan, then further approval from ADEM may be required. The final cap will be graded so

that surface water does not pond on the landfill. The side slopes will be graded to a maximum of 25 percent, and the top slopes will not be less than 5 percent.

8.1.3 Horizontal Terraces

Horizontal terraces will be constructed for every 20-feet rise in elevation to provide erosion control. Each terrace will be constructed with a minimum 15-foot wide bench.

8.1.4 Final Grading Within 90 Days

Final grading will be provided within 90 days after the landfill has reached the final approved elevations or landfilling has permanently ceased to occur in each phase.

8.1.5 Vegetative Cover Within 90 Days After Final Grading

Vegetative cover will be established on the final cap to reduce erosion and maximize evapotranspiration. The cover surface will be scarified, fertilized, limed, seeded, and mulched as soon as practical or within 90 days after completion of the final grading of each phase.

Appropriate species of grass seed, fertilizer, lime, and their rate of application will be consistent with the recommendations of the local Soil Conservation Service. The vegetative cover will be nurtured and maintained until it has established itself.

8.1.6 Maintenance

Maintenance of the final cap will include routine inspections for rills and gullies, ponding of water, or areas of distressed vegetations.

Eroded areas will be filled with suitable soil or re-worked, compacted, graded, and vegetated. Areas where ponding is occurring will be filled, graded, and vegetated. For those areas with extensive surface cracks, corrective measures may include, but are not limited to: scarify the area, excavate and recompact the soil, or other measures as necessary. Areas of distressed vegetation will be checked for possible methane gas venting. If excess gas is detected, suitable permanent venting will be installed. If gas is not detected, the distressed area will be mulched, fertilized, and re-seeded to promote new growth. An appropriate cover will be maintained on the landfill at all times.

8.1.7 Signs

A sign will be posted at the main entrance gate stating that the landfill is permanently closed.

8.1.8 Record Notation on Land Deed

Within 90 days after the permit expiration or closure requirements are achieved as determined by ADEM, a notation will be recorded onto the land deed and/or some other legal instrument that will normally be examined during a title search, that will in perpetuity, notify any potential purchaser of the property of the following:

1. The land has been used as a solid waste disposal facility.

2. The land use is restricted by the items contained in 335-13-4 of the Administrative Code of ADEM.

3. Locations and dimensions of the disposal facility, with respect to permanently surveyed benchmarks and section corners, will be contained on a plat prepared and sealed by al Land Surveyor. The plat will be titled "Pine Hollow Landfill". The following note will also be prominently displayed: "Operated from (beginning date) to (closure date)."

4. Provide certification by an Engineer of Land Surveyor that all closure requirements have been completed as determined necessary by ADEM.

   A certified copy of the recording instrument will be submitted to ADEM within 120 days after permit expiration, or as otherwise directed by ADEM.

8.1.9 Future Use

There are no future uses planned for the landfill after closure. The closed landfill will remain as grassed slopes unless other uses are submitted and approved by ADEM. Precautions will be taken during the post-closure operations to insure that the integrity of the final cover and components of the landfill are not disturbed.

8.20 POST-CLOSURE

The post-closure maintenance will be conducted for 30 years. Should site specific information obtained during active and/or post-closure periods reveal that the post-closure period be increased or decreased, the information and request for revising the period will be submitted to ADEM.

8.20.1 Post-Closure Maintenance

Post-closure maintenance inspections will be performed to assure that the landfill is in accordance with the permit, and that human health and the environment are not adversely impacted. The inspection will include the final cap, access roads, signs, fencing, surface water management system, and any other indications of potential problems. Inspection of the closed landfill will be performed to ensure that all post-closure requirements have been met.

If an inspection indicates that corrective measures are required to repair or restore a component, maintenance will be performed as soon as practical.

The site will be mowed as needed to maintain a healthy vegetative growth.

8.20.2 Access Control Structures

The erected fences, main gate, and the natural barriers are all used to control access into the facility during the active operation. To protect and maintain the integrity of the closed landfill, these structures will be maintained and kept functional to control access during the post-closure period.

8.20.3 Vector Control

The routine post-closure maintenance inspection will include a check for vectors. Vectors are not anticipated to be a problem during the post closure period. However, should vectors become a problem, the appropriate measures to control them will be taken.

8.20.4 Post-Closure Maintenance Schedule

The post-closure maintenance inspections will be conducted monthly and after storm events during the first two years. During the third year to the end of the post-closure period, the inspections will be conducted at least quarterly and after severe storm events.

Appendix A

Wetland and Listed Species Survey Report

Bingham Environmental

215 W. College Avenue, Suite 504 Tallahassee, Florida 32301 850.567.1459

July 20, 2008

James Bundy, P.E.
Hatch Mott MacDonald
120 Beckrich Road, Suite 180
Panama City Beach 32407

Dear Mr. Bundy:

Attached please find the Pine Hollow, Inc. Landfill WETLANDS AND LISTED SPECIES SURVEY REPORT and the Reaves Wrecking Company Pine Hollow Landfill expansion plat .

Thank you for using Bingham Environmental for this project. Call 850-567-1459 should you have any questions.

Yours truly,

Frasier O. Bingham, Ph.D.

Attachments

WETLANDS AND LISTED SPECIES SURVEY REPORT

PINE HOLLOW, INC. LANDFILL

PHENIX CITY, ALABAMA

by

Frasier O. Bingham, Ph.D.
Environmental Consultant

On July 9, 2008, Dr. Frasier Bingham of Bingham Environmental, Tallahassee, Florida, conducted a wetlands and listed species survey at the Pine Hollow, Inc. Landfill.

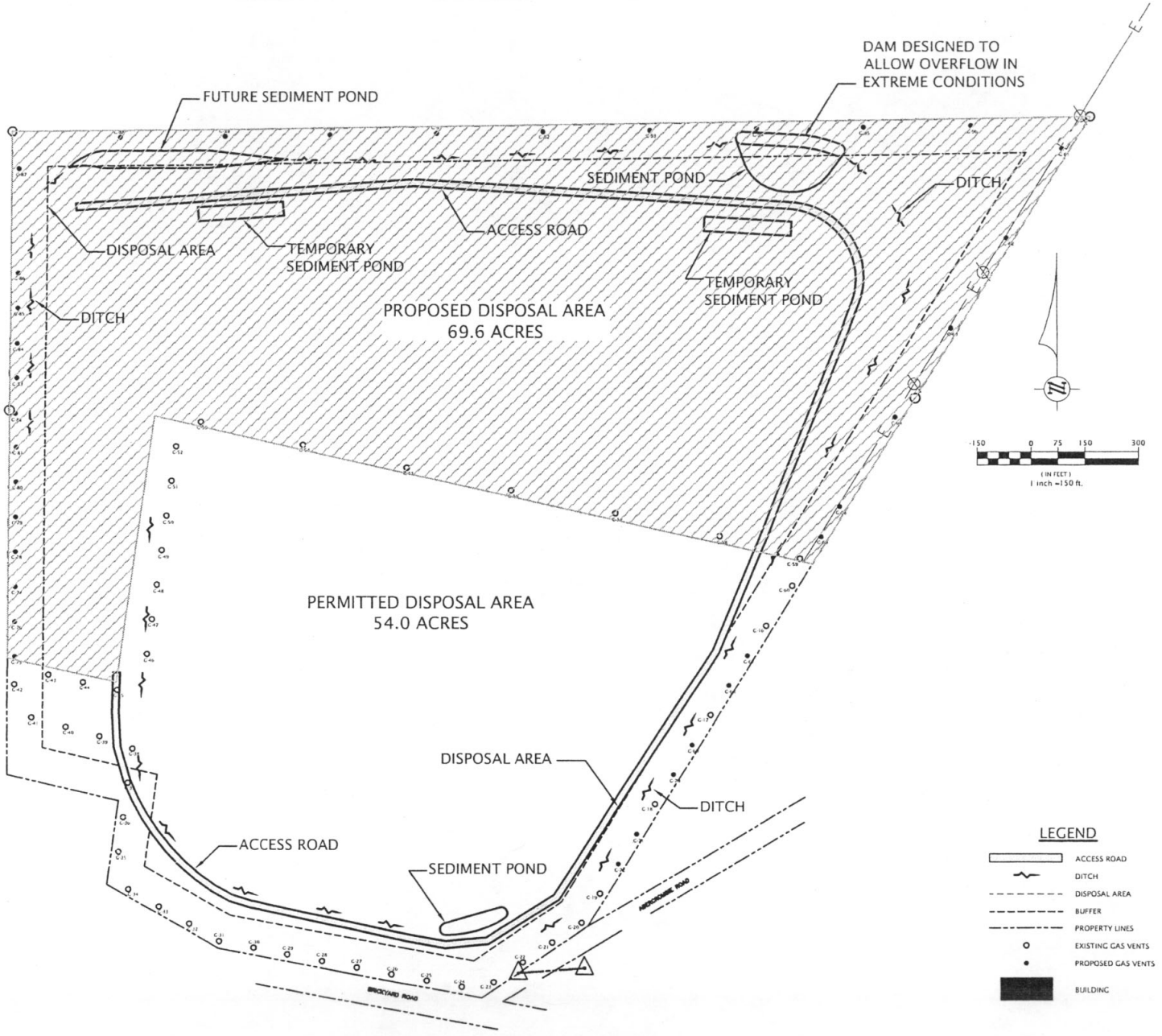
This study covered a proposed disposal area of 69.6 acres directly adjacent to and north of the presently permitted disposal area of 54.0 acres.

The entire study area had over the past few years been clear–cut for timber and cleared. No jurisdictional wetlands or listed species were noted.

Attachment 1. locates a stormwater ditch inside and along the eastern boundary of the landfill site. This ditch only conveys water during and directly after rain events. A recently constructed siltation pond that is permanently flooded and dammed at its northern edge receives and retains stormwater from this ditch in most rain events. The dam is designed to allow over-flow in exceptional conditions.

Attachment 1. also locates a soon to be constructed sediment pond near the northwest corner of the site. This pond will receive stormwater via a ditch to be constructed running north along the west side of the landfill site. This sediment pond will also be dammed along its northern edge . This dam will also be designed to allow over-flow in exceptional conditions.

Call me at 850.567.1459 if there are any questions.



REAVES WRECKING COMPANY
PINE HOLLOW LANDFILL EXPANSION

PHENIX CITY, ALABAMA

ATTACHMENT 1

P:\237654CE01 Reaves - Pine Hollow Landfill\Drawings\Civil\Attachment 1.dwg, 9/8/2008 10:29:32 AM

Appendix B

Cultural Resource Survey

STATE OF ALABAMA
ALABAMA HISTORICAL COMMISSION
468 South Perry Street
MONTGOMERY, ALABAMA 36130-0900

AUG 28 1997

F. LAWERENCE OAKS
EXECUTIVE DIRECTOR

BRP ~~TELEPHONE~~ NUMBER
JMB 334-242-3184
DN
CRE
BW
MBB ✓
RTG
RSM

August 22, 1997

Mr. Michael B. Bomar
SMTH
P. O.Box 2309
Panama City, FL 32402-2309

Re: 97-1216
Cultural Resource Assessment
BCM/Smith #05-6842-02
Pine Hollow Landfill
Russell County, AL

Dear Mr. Bomar:

Upon review of the cultural resource assessment conducted by Garrow and Associates, the Alabama Historical Commission has determined the following. The results of the assessment indicate that there are no cultural resources listed on or eligible for the National Register of Historic Places within the project boundaries. Therefore, our office can concur with the proposed project.

We appreciate your efforts in helping us preserve Alabama's non-renewable cultural resources. Should you have any questions or comments or if we may be of further service, please contact this office.

Sincerely,

F. Lawerence Oaks
State Historic Preservation Officer

FLO/GCR/gtj

CULTURAL RESOURCE SURVEY FOR THE PROPOSED EXPANSION OF THE PINE HOLLOW LANDFILL IN RUSSELL COUNTY, ALABAMA

July 2008

CULTURAL RESOURCE SURVEY FOR THE PROPOSED EXPANSION OF THE PINE HOLLOW LANDFILL IN RUSSELL COUNTY, ALABAMA

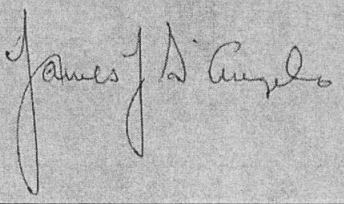
Submitted to:

Pine Hollow, Inc.
701 Tenth Street
Columbus, Georgia 31901

Submitted by:

TRC
4155 Shackleford Road Suite 225
Norcross, Georgia 30093

TRC Project # 161620



James J. D'Angelo, Ph.D., R.P.A., Principal Investigator

Authored by:

James J. D'Angelo and Jeffrey L. Holland

July 2008

MANAGEMENT SUMMARY

On July 2–3, 2008, TRC conducted a cultural resources survey for the proposed 50-acre expansion of the Pine Hollow Landfill in Russell County, Alabama. The survey focused on archaeological and historic resources in the project's Area of Potential Effects (APE). For archaeological resources, the APE consisted of the actual expansion tract where ground-disturbing activities are possible. For historic architectural resources, the APE included an area up to 0.5 miles around the project tract where historic properties may lie within view of the proposed changes to the landscape. The actual APE for historic resources was then adjusted, based on topography and vegetation, to an irregular area consisting of the actual viewshed.

A background literature and records search was conducted prior to commencement of field studies. For this search, the records of the Alabama Historical Commission in Montgomery and the Alabama State Site File were reviewed. No previously recorded historic structures were reported within the project's APE, and no previously recorded archaeological sites were reported within the project's boundary. One archaeological site, 1RU356, is located about 500 feet (148 m) south of the south boundary of the current project area, but no other previously recorded sites were recorded with 1 mile of the study area.

During the field investigations, no new archaeological sites were identified within the project area. Two isolated prehistoric artifacts, IF1 and IF2, were recorded. No historic structures were identified within the APE for the landfill expansion. Therefore, TRC recommends no further cultural resource investigations in advance of this project.

ACKNOWLEDGMENTS

TRC thanks Craig Reaves and Kenny Moore for providing logistical support throughout the fieldwork.

Sterling Howard assisted with the archaeological fieldwork under the direction of James D'Angelo. Jeff Holland prepared the historical background. Vince Macek designed the report graphics. Larissa Thomas provided technical review and produced the report.

CONTENTS

FIGURES

I. INTRODUCTION

On July 2–3, 2008, TRC conducted a cultural resources survey for the proposed 50-acre expansion of the Pine Hollow Landfill in Russell County, Alabama. The tract is located southwest of Phenix City and Kaolin, and north of Brickyard, Alabama (Figure 1). The tract consists of recently timbered land situated south of Seale Road, east of State Route (SR) 165, and west of a transmission line. The original landfill tract is located to the south. The survey has been required by the Alabama Department of Environmental Management. The investigations focused on archaeological and historic resources in the project's Area of Potential Effects (APE). For archaeological resources, the APE consisted of the actual expansion tract where ground-disturbing activities are possible. For historic architectural resources, the APE included an area up to 0.5 miles around the project tract where historic properties may lie within view of the proposed changes to the landscape. The actual APE for historic resources was then adjusted, based on topography and vegetation, to an irregular area consisting of the actual viewshed (see Figure 1).

A background literature and records search was conducted prior to commencement of field studies. For this search, the records of the Alabama Historical Commission in Montgomery and the Alabama State Site File were reviewed. No previously recorded historic structures were reported within the project's APE, and no previously recorded archaeological sites were reported within the project's boundary. One archaeological site, 1RU356, is located about 500 feet (148 m) south of the south boundary of the current project area, but no other previously recorded sites were recorded with 1 mile of the study area.

During the field investigations, no new archaeological sites were identified within the project area. Two isolated prehistoric artifacts, IF1 and IF2, were recorded (see Figure 1). No historic structures were identified within the APE for the landfill expansion. Therefore, TRC recommends no further cultural resource investigations in advance of this project.

This report continues with environmental and cultural context information in Chapters II and III, a discussion of survey methods in Chapter IV, results in Chapter V, and a brief summary in Chapter VI. References cited are at the end of the report.

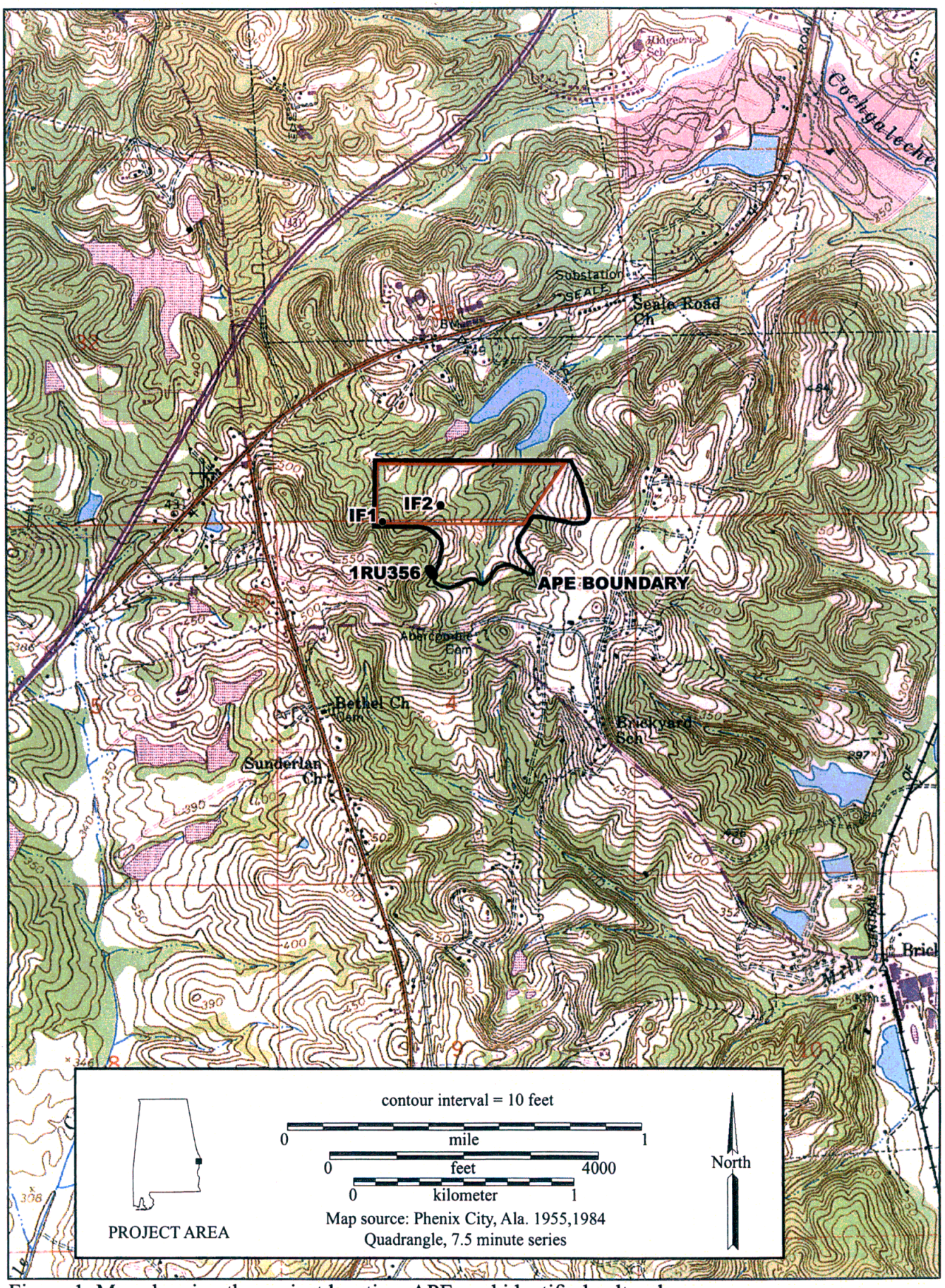


Figure 1. Map showing the project location, APE, and identified cultural resources.

II. NATURAL SETTING

PROJECT SETTING

The project area is located in northeast Russell County, Alabama, just south of Phenix City and less than 2 miles northwest of historic Brickyard. Based on a 2003 aerial photograph, the study area was wooded at that time. At the time of the survey, the entire 50-acre survey tract had been logged (Figure 2). The northeast corner of the tract has been logged, graded, and planted in what appears to be a type of tall rye grass (Figure 3). This area is separated from the rest of the project tract by a stream, recently modified, that had flowed into a man-made lake north of the project area, but now terminates in another pond within the project tract (Figure 4, and see Figure 1). The middle portion of the tract, situated between this stream and the top of a northeast trending ridge, has been logged and grubbed (Figure 5). This grubbed area is highly disturbed, providing close to 100 percent surface visibility (Figures 6 and 7). The western end of the tract, west of the ridge, has not been grubbed and is generally covered in new growth, although some push piles indicate that these soils have also been significantly disturbed (Figures 8 and 9).

PHYSIOGRAPHY

Alabama has four main physiographic provinces: the Piedmont, the Cumberland Plateau, the Gulf Coastal Plain, and the Valley and Ridge. The study area is located within the northern part of the upper coastal plain and sits on the Bluffton Formation, which is composed primarily of glauconitic calcareous fine sand, micaceous clay and marl, fossilferous clay, and gray calcareous clay and silt. The Bluffton Formation is in the Selma Group of the Upper Series of the Cretaceous period. Lithic resources in the area are limited but include quartz, quartzite, and possibly Tuscaloosa gravel and sandstone (Szabo 1988).

HYDROLOGY

The study area is drained by unnamed streams that flow north and east to the Chattahoochee River, which is about 3 miles to the east. The Chattahoochee joins the Flint River to form the Apalachicola, which flows into the Gulf of Mexico.

SOILS

According to the Web Soil Survey, about 93 percent (47 acres) of the project area's soils belong to the Troup-Springhill-Luverne complex. The remaining 7 percent (3 acres) are Troup sandy loam (Figure 10). The Troup series consists of deep, somewhat excessively drained, moderately permeable soils with thick sandy surface and subsurface layers and loamy subsoils. They occur on slopes ranging from 0 to 40 percent. Surface soils,

Figure 2. Pan view north to east of project area from southwest corner. Field in Figure 3 indicated.


Figure 3. Pan view south to west of field at east end of project area.

Figure 4. Pan view east to south of modified stream. Field in Figure 3 is beyond tree line.

Figure 5. Pan view south to west of field at east end of project area.

Figure 6. View east of disturbances to ridge from logging and grubbing.

Figure 7. View north along top of ridge showing surface visibility and location of IF2.

Figure 8. View southwest of west end of tract showing new growth. Existing landfill can be seen in the background.

Figure 9. View of new growth and push piles within west end of tract.

Figure 10. Soil map for the project tract.

0 to 3 inches (7.5 cm), are very dark grayish brown (10YR 3/2) fine sand. Subsurface soils, 3 to 15 inches (7.5 to 37.5 cm) below surface, are yellowish brown (10YR 5/4) fine sand. From 15 to 40 inches (37.5 to 100 cm), the soil is strong brown (7.5YR 5/6) loamy fine sand. The Springhill series consists of deep, well drained, moderately permeable soils and is found on slopes ranging from 1 to 35 percent. Surface soils consists of 0 to 5 inches (12.5 cm) of brown (7.5YR 5/4) sandy loam. At 5 to 11 inches (12.5 to 27.5 cm) below surface, the soil is yellowish red (5YR 4/6) sandy loam, and from 11 to 30 inches (27.5 to 75 cm), it is red (2.5YR 4/6) sandy clay loam. Luverne fine sandy loam occurs on convex 4 percent slopes in woodlands. It consists of 0 to 1 inches (2.5 cm) of dark grayish brown (10YR 4/2) fine sandy loam; from1 to 7 inches (2.5 to 17.5 cm) below surface, it is brown (10YR 5/3) fine sandy loam. Red (2.5YR 4/6) clay occur at 7 to 20 inches (17.5 to 50 cm) below surface with red (2.5YR 4/6) clay loam from 20 to 30 inches (50 to 75 cm).

CLIMATE

Russell County's climate is described as temperate, with long hot summers and rain spread out relatively evenly throughout the year. March receives the most rain on the average, with less frequent rainfall in the fall. Warm to hot days generally occur from May until October. During summer, weather patterns from the south make the climate almost subtropical. Temperatures can be 90 degrees or above 85 days a year. The first freeze usually occurs around mid-November. Winter days are often cloudy due to the interaction of moist air from the Gulf and cold, dry air from the north. Snowfall is rare (Mason 1994).

FLORA AND FAUNA

Vegetation in the area encompassing the project includes stands of planted pines and areas of natural regeneration containing a mixture of pines and hardwoods (Braun 1950). The mixed pine and hardwood forests include loblolly, shortleaf, longleaf, and slash pine as well as hickory, oaks and various understory trees. Deciduous trees common to the wetlands include blackgum, sweetgum, and laurel, swamp, and water oaks.

Mammal and marsupial species found in the region include beaver, bobcat, cotton mouse, cottontail rabbit, coyote, field mouse, flying squirrel, fox squirrel, gray squirrel, gray fox, mole, opossum, pocket gopher, raccoon, red bat, rice rat, swamp rabbit, weasel, white-tailed deer, and wood mouse (Golley 1962).

PALEOENVIRONMENT

The contemporary climate and vegetation of the Gulf Coastal Plain are products of long and complex processes of natural and human-induced change that have occurred over the last 23,000 years. During the glacial periods, the area south of the Laurentide Ice Sheet provided a refuge for plants and animals whose distribution changed during interglacial

time periods. Recolonization or spread of some species occurred during interglacial times. Humans, both Native and Euro- Americans, have had major environmental impacts, especially over the last 200 years.

The Southeast has diverse physiographic regions and plant communities, resulting in a "...richness in species of both woody and herbaceous vascular plants, and its large number of endemic plant species" (Delcourt and Delcourt 1985:1). Goshen Springs in south-central Alabama has provided regional palynological data (Delcourt 1978, 1985), as have many other radiocarbon-dated sequences in the Southeast. Uphapee Creek, Alabama, on the Fall Line in the central part of the state, has also provided data on paleoclimate for the area (Delcourt and Delcourt 1985).

Fluctuations in sea level were the primary factors that affected river systems of the Gulf Coastal Plain, but climatic change, vegetation cover, and variable precipitation were also factors in the late Quaternary period (Delcourt 1985). "In the Gulf Coastal Region of the southeastern United States, lacustrine sedimentation was slow during the full- and late-glacial interval, a period of zonal atmospheric circulation and minimal precipitation. Lacustrine sedimentation rates increased after 8000 yr. B.P. in response to increased summer precipitation from the Maritime Tropical Airmass" (Delcourt 1985:17).

Average temperatures in the last full glacial period (ca. 23,000–13,000 B.C.), which presumably predated the arrival of *Homo sapiens* in North America, were considerably cooler than at present (Delcourt and Delcourt 1983; Whitehead 1973). In the Late Wisconsin glacial period, when humans apparently first arrived in what is now the state of Alabama, ca. 13,000–9000 B.C., the climate gradually warmed and precipitation increased. Sea levels would have been 70 m below present-day levels. By 6000 B.C., the sea level was approximately (within a few meters) at modern levels (Anderson et al. 1996). Modern flora in the southeast would have been established by 10,500 B.C. The Maritime Tropical Airmass dominated the Gulf Coast Region and affected major vegetation patterns south of Latitude 33 degrees N at 18,000 B.P. This air mass was pushed northward from 17,000 to 16,000 B.P., resulting in increased precipitation and heat, particularly during the summer, and bringing late glacial climatic conditions (Delcourt 1985). By the mid-Holocene (especially 8000–6000 B.P.), increased precipitation in the Southeast from the concentrated Maritime Tropical Airmass allowed pines to spread into both the Atlantic and Gulf Coastal Plains, where xeric oak-hickory forests once predominated. Also, the rising sea level and increased precipitation resulted in the development of bottomland swamps and marshes (Delcourt 1978). Since 3000 B.C., the climate has cooled slightly and precipitation has possibly increased, leading to the conditions that exist today.

During the full-glacial period the dominant overstory vegetation was temperate mesic oak-hickory forest (probably continuous in the sandy uplands). Areas of mixed hardwoods would have occurred along major drainages. There would have been a surrounding Southeastern Evergreen forest region persistently from 18,000 to 200 B.P. (Delcourt and Delcourt 1985). Not until during the mid-Holocene, about 5000 B.P., would southern pine have dominated where oak and hickory once dominated the Southeastern Evergreen forest community. One possible explanation postulated for this shift is

frequent fires, which might have been set by Late Archaic Native Americans to increase faunal carrying capacity and open the forest. Alternatively, it has also been suggested that hurricane intensity increased during this time, in association with the strengthening of the Maritime Tropical Airmass (Delcourt and Delcourt 1985).

Faunal communities were changing, as well. Many large mammals that inhabited North America during this time (mastodon, giant ground sloth, horse, camel, saber-toothed tiger, etc.) became extinct by 8000 B.C. They were victims of a mass North American extinction that involved 33 genera of large mammals adapted to the cold, dry environmental systems of the Late Pleistocene (Martin 1984). The retreat of the Laurentide Ice Sheet, which induced a warmer, wetter climate throughout North America, and the arrival of humans heavily reliant on many of these animals for subsistence are considered major factors in the megafauna's demise (Martin 1984).

Numbers of individuals and the geographical distribution of species have been greatly altered. Between ca. 8000 B.C. and A.D. 1540, the animals inhabiting central Alabama included bear, white-tailed deer, elk, bison, wolf, fox, bobcat, beaver, rabbit, mink, skunk, opossum, raccoon, and a variety of reptiles and amphibians. Migratory waterfowl, turkey, dove, quail, and bald and golden eagles were plentiful. Aquatic resources such as freshwater mussel and a variety of fish were also present. Many animals have been eradicated from the area since the advent of the historical period, including bison, elk, cougar, and wolf. Many others, such as bear and beaver, have been greatly reduced in number.

Vegetation in the Alabama Coastal Plain has suffered extensive alteration in the past two centuries, complicating any estimation of the relative quantities of original species and their distribution across the landscape. Originally, the land was predominantly forested. Large-scale clearing and cultivation in the nineteenth century removed large tracts of native forest and caused serious erosion. The Gulf Coast is now predominated by pines in the sandy uplands (Delcourt and Delcourt 1985). There are 11 species of pine native to the area in the Southeast today; many of these require dry settings. The Coastal Plain species are more tolerant of wet conditions. Much of the region is in planted pines today. Logging activities have dramatically altered the landscape through erosion and changes in both the over- and understory.

III. CULTURAL CONTEXT

THE PREHISTORIC PERIOD[1]

Paleoindian Period (12,000 to 9,000 B.C.)

The peopling of the Americas occurred at the end of the last ice age during the late Pleistocene Epoch of the Cenozoic Era, or sometime after 40,000–9,000 B.C. The presumed immigration route was the Beringia land bridge from Siberia to Alaska and then southward through a series of gradually fluctuating "ice-free corridors." Humans probably spread with migrating herds of large animals, which fed on the grassy tundra, and finally settled in the southeastern U.S. The environment there during the period from 13,000 to 8,000 B.C. was characterized by a replacement of the pine and spruce forests by northern hardwoods, such as beech, birch, elm, hemlock, hickory, and oak. Areas of prairie were mixed with forest during this period creating a savannah-like mosaic pattern. The period was marked by increasing temperatures and precipitation (Watts 1971; Whitehead 1973; Bryson et al. 1970). At White Pond in central South Carolina, the pollen record indicates "a mosaic of pine and spruce stands with prairies and sand- dune vegetation" during the period from 17,150 to 10,850 B.C. (Watts 1980:187). The subsequent period at White Pond, from 10,850 to 7,550 B.C., was dominated by beech, hickory, ironwood, and oak. Delcourt and Delcourt (1987) suggest that the transition to hardwoods in central Georgia was established considerably earlier.

The Paleoindian period of Alabama and Georgia is known almost exclusively from the distribution of isolated projectile point finds across the region, and no detailed study of an excavated Paleoindian site has been done. The classic Clovis fluted point, an undisputed marker of the Paleoindian period, is rare in the region. More common are unfluted types such as Simpson, Suwanee, or Cumberland, which are thought to date to the Late Paleoindian period. Paleoindian sites with organic preservation are unknown in Georgia and Alabama. A recent summary of the current state of Paleoindian data for Georgia was compiled by Anderson et al. (1990). As their study shows, most of our information is derived from surface data, although several Late Paleoindian sites in Georgia, notably Taylor Hill on the Savannah River watershed, 9GE309 on the Oconee River watershed, and Muckafoonee on the lower Flint River drainage have been sampled. In a distributional study of two areas of the central Georgia and western South Carolina Piedmont, O'Steen et al. (1987) observed a trend towards greater utilization of upland areas and minor streams from the Early to Late Paleoindian and Transitional Paleoindian periods. Chase noted numerous surface finds of "Folsomoid" points in the Fort Benning area, and he states that one was excavated from the Early Archaic zone of the McKenzie Shelter Cave in Harris County, Georgia, in 1961 (Chase 1963a).

---

[1] This section derives in large part from Elliott et al. (1995).

The Clovis point stands as the best-known item in the Paleoindian toolkit (dating 9800–9000 B.C.), and is generally recognized as the earliest tool form in North America. However, a recent excavation at the Topper Site, on the South Carolina side of the Savannah River (Goodyear 2001, 2002), offers tantalizing evidence of a pre-Clovis occupation. Here, in stratigraphic position below the Clovis levels, researchers uncovered a distinct lithic assemblage characterized by spatially clustered concentrations of multifaceted flakes and chunks of chert along with several flake tools. These tools, referred to as "bend break tools", are essentially thin flakes broken to provide a chisel-like working edge, some of which exhibit use wear patterns suggesting use as a burin or graver. This apparent pre-Clovis occupation is also distinguished by exploitation of a separate chert source than that of later occupations. Research here is on-going and is subject to intense scrutiny.

Paleoindian sites include seasonally occupied camps. Elsewhere in the eastern U.S., Paleoindian sites have yielded evidence of hunting, or possibly scavenging, of extinct large game species. The key diagnostic is the fluted point, although unfluted varieties and Dalton variants now are considered as Paleoindian types rather than Early Archaic.

Dalton, Tallahassee, Quad, and Hardaway projectile points were produced during the Transitional Paleoindian/Early Archaic period, after 9,000 B.C. These points are morphologically similar to earlier Paleoindian lanceolate point forms, but lack the central channel flute and they have a shouldered hafting element not seen previously. Other side notched tool forms, such as the Taylor and Bolen points, may have been part of the Transitional Paleoindian tool kit, but these tools are more commonly attributed to the Early Archaic period.

The Archaic Period (8,000 to 700 B.C.)

The Archaic period into three subperiods: early, middle, and late, the latter of which encompasses the Gulf Formational concept. When "Archaic" and "Woodland" concepts were conceived during the 1930s, pottery was the primary trait used to distinguish the two. The advent of radiocarbon dating and its application to early fiber tempered ceramics, however, placed the first pottery well into what had been considered the Archaic. Sites that contain fiber tempered pottery or soapstone bowls were grouped into a Terminal Archaic/Gulf Formational category, even though the original researchers may have defined them as Late Archaic or Early Woodland. In cases where stemmed Late Archaic style points also were present, this component was included in addition to the Terminal Archaic/Gulf Formational assignment. Refining a chronology for Archaic point types remains a problem for archeologists.

Early Archaic Period (8,000 to 5,500 B.C.). By the Early Holocene Epoch many species of large mammals, or megafauna, such as the cave bear, giant beaver, giant ground sloth, glyphodont, horse, jaguar, mammoth, and mastodon had become extinct. Shrinking ranges of other species that once lived in the southeastern U.S., such as the caribou, also had occurred by that time. During the Early Archaic, deer and black bear emerged as the large mammals that were exploited for food. The northern boreal forest was gradually replaced with a forest mosaic more commonly found in the region today. Based on the

pollen record at White Pond in central South Carolina, Watts (1980:187) notes that by 7,550 B.C. oak and pine forest dominated the landscape and pine became increasingly important in the later Holocene. In extreme south Georgia, the period from 6,550 to 3,050 B.C. was marked by "predominantly sclerophyllous oak forest, scrub, or savanna, probably with patches of bluestem prairie" (Watts 1971:676). The oak-hickory forests persisted in the Piedmont, but oak declined in frequency in the Coastal Plain during the period 6,000 to 4,000 B.C. Southern pine forests replaced the oak-dominated forests in the region during this period, which probably signifies reduced mast production during this period (Delcourt and Delcourt 1987:254).

Sites from the Early Archaic period in the vicinity of the project area are known only from stone tools. Sites with special conditions of submerged, oxygen-reduced environments, extremely dry or low acid soils, such as Russell Cave in northern Alabama or Windover in central Florida, have yielded organic remains from the period. The diagnostic markers of the Early Archaic period include a variety of corner and side notched projectile point forms, including Bolen, Big Sandy, Kirk, Palmer, and other types. A. R. Kelly, from his River Basin work in Clay County, Georgia, was one of the first to realize the antiquity represented in Early Archaic assemblages from the lower Chattahoochee River watershed. The "Standing Boy Flint Industry" was defined by Huscher (1964) for the region, and it is clear Huscher is describing an Early Archaic or Paleoindian flake tool assemblage.

Early Archaic subsistence was characterized by diversified hunting and gathering, with settlement in seasonally occupied camps. Evidence of occupation is more substantial than for the Paleoindian and Transitional Paleoindian periods and many sites contain multiple projectile points and other parts of a diverse lithic flake tool kit. Side notched and corner notched projectile points are the key diagnostics of the period.

Lithic assemblages from this period also contain finely flaked unifacial and bifacial tools including gravers, side and end scrapers, burins, backed knives, and adzes. Early Archaic groups probably covered large territories, and group size consisted of bands, perhaps combining into macrobands together at certain times of the year. Anderson and others have presented a model of Early Archaic settlement for the South Atlantic slope that involves a single band operating within each of the major river drainage basins. These bands gathered in aggregate camps, possibly at fall line locations (Anderson and Hanson 1988).

Portions of the Archaic sequence have been dated from the Savannah and Tennessee River areas, and from the Stanfield Worley Shelter of Alabama. The sequence also relies heavily on chronologies established in Piedmont North Carolina by Coe (Coe 1964; Crook 1990; DeJarnette et al. 1962).

Middle Archaic Period (5200 to 3,000 B.C.). The climate during the Middle Archaic period has been referred to as the Altithermal, or Hypsithermal, where temperatures were somewhat warmer and drier than modern conditions. Watts (1971:676) suggests that by 3,050 B.C. the uplands of the Coastal Plain were dominated by pine forest, accompanied by a more diverse flora of broad-leaved trees than were present before. It was about the

same time that bayhead and cypress swamp vegetation became significant and *Fagus* (beech) became abundant. Gunn and Wilson (1993) suggest that average temperatures were not all that different than today, but that the drier conditions led to extreme variations, i.e. scorching temperatures during the day followed by freezing temperatures at night. This stressful climatic variation resulted in necessary changes in subsistence strategies, mobility, and social organization that are reflected in the archeological record. By 3,500 B.C., the climate developed into what exists today, and it was at this time that the swamps formed along the rivers of the Coastal Plain. Although fluctuations in sea level have continued to the present, these variations are not thought to have significantly affected the environment of the upper Coastal Plain sand hills and fall line regions.

The diagnostic markers of the Middle Archaic period are a variety of stemmed projectile points including Benton, Elora, Guilford, Morrow Mountain, and Stanly types. In Georgia, the Old Quartz typology, a term coined by Caldwell (1958), includes many Middle Archaic point types, but it may also include earlier and later point types, and therefore is of limited use for dating sites. The use of the term has been discontinued. The diverse tool kit seen with the Early Archaic period is not so evident during Middle Archaic times. A trend has been observed for assemblages from this period to be more expedient and generalized in form. This change in tool morphology has been explained by accompanying changes in natural resource utilization. During the Middle Archaic period, the territorial range of aboriginal groups probably became more restricted, and it is during this period that we see the first indications of long-distance exchange. Middle Archaic shell midden sites on the Tennessee and Ohio river drainages, at sites such as Indian Knoll, Carlson Annis, and Eva, contain burials, often accompanied with grave goods such as marine shell beads, axes, atlatl weights, and exotic chipped stone tools. While Middle Archaic sites in the Chattahoochee River watershed do not exhibit obvious evidence of a long-distance exchange system, the presence of marine conch or whelk shells at sites far into the interior of the continent may have involved groups in the region acting as intermediaries in a reciprocal, "down- the-line," exchange network. While the beginnings of horticulture date back to the Middle Archaic period in the Mississippi valley, no evidence of cultigens has been found on Middle Archaic sites in the Chattahoochee River valley to date.

In the Georgia and Alabama Piedmont, Middle Archaic sites are dominated by Morrow Mountain type sites. Within the upper Coastal Plain, however, the Middle Archaic period is not well documented. This has been, in part, a recognition problem since archeologists cannot agree on what stone tools date to the Middle Archaic period in that region. Many stemmed point forms, traditionally classified as Late Archaic types, and comer notched forms, traditionally classified as Early Archaic types, may actually date to the Middle Archaic period.

Late Archaic Period (3,000 to 1,000 B.C.). The Late Archaic period ushers in the beginnings of sedentary life with some sites permanently occupied, or occupied most of the year, among Native American groups in the Chattahoochee valley. Sites from this period are common in the region (Chase 1963a). Large stemmed points and atlatl weights are diagnostic of the Late Archaic period.

By the end of this period, pottery was being produced. While Late Archaic sites elsewhere in the country have yielded evidence of horticulture, this has not been documented in the Chattahoochee River valley. Many researchers consider the subsequent Terminal Archaic or Gulf Formational period to be part of the Late Archaic, while others consider the advent of pottery to be *the* distinguishing marker that separates Archaic from Woodland lifeways.

Caldwell, who had a keen interest in the evolutionary origins of agriculture worldwide, considered that "Primary Forest Efficiency" had been achieved by Late Archaic times. By this he meant that humans living in the eastern woodlands of North America had "settled in" to their environment, become aware of most of the useful plants, animals, and other natural resources available to them, and had developed an optimal resource use strategy of hunting and gathering that was a state of near homeostasis, or equilibrium. Native Americans' awareness of their environment probably has greater antiquity, however, and Early Archaic, and possibly Paleoindian groups made more extensive use of botanical resources than was formerly thought.

Terminal Archaic/Gulf Formational Period (2.500 to 700 B.C.). By 2,000 B.C., Native Americans in Georgia and Alabama had adopted most of the cultural traits that we associate with historic tribes. The stone tool inventory was supplemented by the development of ceramic arts. Sites from this period are identified by the presence of fiber tempered pottery and the use of stone bowls made from soapstone or sandstone. Societies from this period are considered to be egalitarian, probably organized as complex bands, or possibly tribes. Towards the end of this period, Poverty Point, a complex mounded site in central Louisiana, became a significant influence on groups in the project region. The Poverty Point culture included long-distance trade of exotic stone items, and people living in the Chattahoochee Valley were likely participants in this trade, possibly acting as intermediaries in an incipient tribute exchange system. The influence of Poverty Point on groups living in the eastern woodlands is not well understood, but it is apparent that significant numbers of soapstone bowls formed part of this exchange. What was received in exchange for these bowls is not clear; it may have been abstract concepts of religion, political organization, or agricultural techniques.

The fiber tempered ware found in the region has been identified variously as Stallings Island, Orange, or Norwood wares. The Orange pottery series, defined in Florida, is not often applied to the interior of Georgia or Alabama. The Norwood series, also defined in Florida, is not widely recognized by modem researchers. Most have identified the fiber tempered wares as Stallings Island series, although a definitive analysis of this pottery has not been conducted. The most in-depth treatment of the fiber tempered pottery was conducted at the Carmouche site (9ME21). Sites from the Gulf Formational period also are marked by the use of stemmed projectile points, often indistinguishable from earlier Late Archaic stemmed point forms (Jenkins 1978; Walthall and Jenkins 1976).

Fiber tempered pottery includes plain, incised, and punctated vessels. Some of the sherds are entirely fiber tempered, while others, presumably later in the sequence, contain fiber and grit tempering. Chase notes that the sherds with mixed temper tend to be thinner sherds and are more likely to bear design motifs. Important excavated sites of the fiber

tempered culture include the Water Tower Site (9CE33), Carmouche (9ME21), and Snelling's Pond (9CE2O) (Chase n.d.; Gresham et al. 1985).

The soapstone bowl industry may have lasted more than 1,600 years in Georgia. Most of the radiocarbon dates for sites with soapstone bowls are from the Tennessee Valley, where they generally date to after 1,600 B.C. The earliest reported date in Georgia is 2,220±150 B.C., obtained from a hearth feature containing a soapstone bowl sherd at 9FY36 on the upper Flint River drainage (Elliott 1989:93). This single date deviates from the norm, however, and it needs to be corroborated before the antiquity of the stone bowl industry can be firmly established. The most recent date for soapstone bowls in Georgia, 600±60 B.C., was obtained from the Cagle Site, although Dunlap, Cartersville, and Mossy Oak pottery were found in the same stratum (Crook 1984). Radiocarbon dates from eastern Tennessee for soapstone bowl strata, however, suggest that this tradition continues into the eighth century B.C. A date of 1,460±80 B.C. was obtained from a nondiagnostic feature within a midden containing soapstone bowl sherds and Stallings Island pottery reported from McCalla Bottoms on the upper Savannah River (Anderson and Joseph 1988:Appendix). Bullen obtained a date of 1,200±250 B.C. (3,150±250 B.P.) (M-394) for an Orange phase fiber tempered pottery and soapstone bowl stratum at site J-5 in Lake Seminole (Bullen 1958). Phelps obtained a date of 1,012±120 B.C. (2962±120 B.P.) (FSU-67) for Norwood Plain and Norwood Simple Stamped pottery from the Tucker site (FRI) in Florida. Other radiocarbon dates for Stallings Island pottery are reviewed in Elliott et al. (1994) and Sassaman (1993).

Woodland Period (700 B.C. to A.D. 900)

The Woodland period has been divided into three subperiods: early, middle, and late. The division boundaries between these subperiods are indistinct, however, due to several key diagnostic pottery types that bridge the gap between these subperiods.

Early Woodland Period (700 to 300 B.C.). Dunlap Fabric Impressed pottery is the earliest marker of the Early Woodland period in the region. Although Dunlap Fabric Impressed pottery, tempered with sand or crushed quartz, is associated most closely with the Early Woodland, other ceramic types also are associated with Early Woodland sites in west Georgia and some Early Woodland sites lack fabric-impressed wares (Benyshek et al. 2003; Caldwell 1957:166). Large triangular projectile points also were part of the material inventory at this time. Increased use of subterranean storage pits, possibly for caching acorns and hickory nuts, is observed on excavated sites from this period. Radiocarbon dates obtained for three Kellogg phase (Dunlap Fabric Impressed pottery) sites in northwestern Georgia range from 636 B.C. to A.D. 95 (Bowen 1989). By late in the Early Woodland, it is likely that a variety of surface treatments were being used to decorate pottery, but for analytical purposes of this study, Deptford or Cartersville wares will be classified as Middle Woodland.

Some archeologists consider Deptford and Cartersville pottery to be Early Woodland types, but most classify these wares as early Middle Woodland. Wood (1981) demonstrated at the Cane Island site on the Oconee River in central Georgia that Dunlap Fabric Impressed, Cartersville Simple Stamped, and Cartersville Check Stamped, were

found in associated contexts. Dates from the Oconee River drainage in Georgia for a Dunlap Fabric Impressed and Cartersville Check Stamped stratum range from A.D. 80±60 to A.D. 245±95 (Bowen 1982; Wood 1981).

Chase (n.d.) identified an early and a mature phase for Deptford in the Chattahoochee valley. The early phase is composed of sand tempered plain and linear check stamped pottery, with some grit tempering. Plain pottery predominates and the vessels are quite large, elongated, semi-conoidal forms adorned with tetrapods. Vessel lips are rounded and flared rims are observed on some specimens. The Walker Street site (9ME60), located in Columbus, Georgia, is possibly one of the best excavated examples of a Deptford phase site near Fort Benning, but a final report of excavations there has not been produced. Huscher's preliminary report is available on microfilm (Schnell n.d.). A radiocarbon date of 240 B.C. (2,190±140 B.P.) (SI-264) was obtained from Feature 13 at the 9ME60. Chase (1959a) also noted finding a pure check stamped zone at the Snelling's Pond site (9CE20).

Mossy Oak simple stamped pottery presents an enigma in ceramic typology that has not been resolved. Works Progress Administration (WPA) excavations at the Mossy Oak site on the Ocmulgee River near Macon, Georgia, yielded a simple stamped ware beneath a Lamar horizon mixed with a Swift Creek deposit. Although the stratigraphy on the site was somewhat blended, general consensus among the archeologists of the day concluded that this ware probably dated to the Early Woodland period (Stoutamire et al. 1977).

Archeologists working at the Refuge site, near the mouth of the Savannah River, had identified an Early Woodland simple stamped ware, Refuge Simple Stamped, and researchers in central Georgia reasoned that the Mossy Oak wares were probably related. Simple stamped wares also have been found in well-dated Early Woodland contexts in west Georgia (Benyshek et al. 2003). Simple stamped and cord-marked ceramics were produced in the region by the Early Woodland, and these motifs may have continued well into the Mississippian period as minority wares (Williams 1977).

Middle Woodland Period (300 B.C. to A.D. 100). The Middle Woodland period begins with the development of new pottery styles including check stamped pottery classified as either Deptford or Cartersville series. The Deptford series, defined by excavations at the Deptford site near Savannah, is widely applied to the Coastal Plain of Georgia, South Carolina, and Florida, while Cartersville, defined by excavations in Lake Allatoona in northwestern Georgia, is more often applied to the Piedmont and Ridge and Valley regions of Georgia. Both are sand tempered wares.

Late Deptford phase sites include plain, check stamped, simple stamped, and cord-marked wares, some with tetrapods. The cord-marked ware continued into the Early Swift Creek levels at Halloca Creek (Chase n.d.). The Late Deptford phase near Savannah is marked by the addition of a complicated stamped pottery, Brewerton Hill Complicated Stamped, that shares many traits with Swift Creek. At the Mandeville site, south of Fort Benning, Late Deptford is classified as Mandeville I. In a summary of radiocarbon dates for Deptford sites in northwestern Florida, Bense (1993) notes a range from 50 B.C. to A.D. 220.

The innovation of complicated stamped design motifs applied to the surface of pottery was unique to a subarea of the southeastern U.S. that includes the project area. The stamped design was applied to the pottery with a wooden paddle while the pot was still in a plastic state. The initial expression of this pottery tradition, and perhaps its zenith as well, has been termed Swift Creek, named for the Swift Creek site on the Ocmulgee River.

Several dates are available for Swift Creek sites throughout Georgia and South Carolina. A few dates are available from the middle and lower Chattahoochee River valley. A sample from an Early Swift Creek pit at Halloca Creek (9CE4) dated to 2,020±150 B.P. (70±150 B.C.) (Chase 1963a). A sample from the lowest levels of the Mandeville site dated to 10 B.C. (1,960±150 B.P.) (M-1042), while the Mandeville II Swift Creek component dated to A.D. 540 (1420±150 B.P.) (M-1044) (Kellar et al. 1962). Chase notes that most of the Swift Creek pottery in Mound A at Mandeville came from a layer that yielded a date of A.D. 90 (1860±65 B.P.) (Chase 1993).

Swift Creek dates from the lower Coastal Plain in eastern Georgia include the Milamo site, A.D. 100±160 (2,050±160 B.P.) (UGA-2992) and the Pike Creek site (9JD8) in Jeff Davis County, Georgia, A.D. 215±70 (2,165±70 B.P.) (UGA-2099). At the Cathead Creek site, at Darien in the Altamaha River delta, a radiocarbon date of 200±50 B.C. (2,150±50 B.P.) was considered "too early" and was "regarded with suspicion." A second date from a pit with Swift Creek pottery dated to A.D. 500±100 (2,450±100 B.P.) (Wayne 1987:55–56). In a summary of radiocarbon dates for Santa Rosa-Swift Creek sites in northwestern Florida, Bense (1993) notes a range from A.D. 150 to A.D. 590. In a similar review of Swift Creek sites for northeastern Florida, Ashley (1993) notes a wide range of dates from 690 B.C. to A.D. 960. Problems with narrowing the range of Swift Creek radiocarbon dates may partially result from mixing of charcoal from earlier and later components with Swift Creek diagnostic artifacts. Most of the Georgia radiocarbon dates, however, fall within the interval from 100 B.C. to A.D. 750.

In Alabama, Swift Creek culture appears defunct by A.D. 800, but Swift Creek dates from northern Georgia push the upper date range of the Swift Creek culture towards the transitional Mississippian period (Chase 1993). The Swift Creek component at 9Ck(DOT)7 in northwest Georgia was dated to A.D. 700±75 (Bowen 1982:113). Late Swift Creek dates from Simpson's Field on the upper Savannah River include: A.D. 630±50; A.D. 720 (Beta 2603); and A.D. 960±50 (Wood et al. 1986:52, 63, 69, 82). Early Swift Creek dates from Cold Springs Mound site, 9GE10, range from A.D. 290 to A.D. 445, but no radiocarbon dates are available from a Late Swift Creek component in the village area (Fish and Jefferies 1983:71; Elliott 1989). Consequently, Swift Creek sites may date to the Middle Woodland, Late Woodland, or both.

Broyles, Snow, and others have reconstructed many of the Swift Creek designs and have used information in the designs to reconstruct fragments of Middle Woodland religious iconography and flaws. Unique paddle designs have allowed geographical distributions of specific vessels produced by the same stamp to be mapped, thus allowing insight into patterns of exchange during the Middle Woodland period. Snow has presented a strong argument for continuity from Middle Woodland to historic aboriginal times of certain

design elements and mythological figures (Stephenson et al. 1991; Williams and Elliott 1998).

By between A.D. 100 and 200, Early Swift Creek Complicated Stamped pottery was being produced, and with its advent, the popularity of the Deptford pottery series declined. This complex is defined as Mandeville EI at the Mandeville site south of the study area. Early Swift Creek pottery is a thin, sand tempered ware that is often complicated stamped over most of the vessel. Small tetrapods are sometimes present. The pots are conoidal with deep straight sides and slightly flaring rims. Notched and scalloped rims are common. Crooked River and St. Andrews Complicated Stamped types have been found on Early Swift Creek sites in the project vicinity. Halloca Creek is the major excavated site from this period nearby, but the results of excavations there are incompletely reported. No Weeden Island or Santa Rosa traits were identified at Halloca Creek (Chase n.d.; 1957; 1963a). Early Swift Creek projectile points are "thin, very broad stemmed points, which in some cases, look almost like 'eared' triangles" (Chase n.d.:3). Swift Creek sites in the project vicinity have been described as "large camps" (Chase 1963b:12). Chase cites the Quartermaster site (9CE42) as a possible exception, which may be a sizable village, although the limits of the site have not been established. He noted a tendency for Swift Creek sites to occur away from main riverways. One excavated example of a possible Middle Swift Creek component is the Upatoi Creek site (9CE75) (Chase 1962).

Classic Swift Creek is a continuation of the complicated stamped tradition, but other changes in vessel form occur. Stamping is accompanied by increasing amounts of plain ware, rim notches are more widely separated, and the scalloped rim forms are replaced by wide grooves spaced between straight sections. The deep conoidal flaring rim vessels continue, but are joined by globular pots. All evidence of tetrapods disappears. Stamping is more sloppily executed and is confined to the upper third of the vessel (Chase n.d.).

Late Woodland Period (A.D. 100 to. 900). Late Swift Creek sites in the project vicinity are recognized by the presence of Weeden Island, and Kolomoki Complicated Stamped pottery in addition to Swift Creek types. Prior to Chase's work at 1RU58, the Kolomoki site was considered the northernmost expression of this ceramic complex (Chase 1963a; Milanich et al. 1984). Jenkins (1978:74) defined the Late Swift Creek and Weeden Island culture as the Kolomoki phase, beginning around A.D. 500 and lasting until A.D. 800, when Weeden Island I culture dominated, which he defined as the Torreya phase. Weeden Island Plain, Weeden Island Red Painted, Carabelle Punctate, and Carabelle Incised pottery types have been identified in the project vicinity for this period (Chase 1963a). Santa Rosa influence at the Mandeville site was most pronounced during the period from A.D. 250 to 500 (Smith 1979).

Swift Creek pottery during this period includes well-executed complicated stamped designs with slightly folded rims. Through time the complicated stamping becomes zoned and the rim fold widths increase. Wakulla Check Stamped pottery, a Late Woodland type, has been reported on Fort Benning, but it has not been found in significant frequencies, which suggests it is a trade ware (Knight and Mistovich 1984:222). Projectile points

during this period include "narrow, crude, stemmed types, rarely more than two inches long" (Chase n.d.:4; 1963a).

Mississippian Period (A.D. 900 to 1540)

The Mississippian period is divided into three subperiods: early, middle, and late. Mississippian culture has often been characterized by temple architecture, large-scale agriculture, and elaborate religious iconography. In the project vicinity, however, mound architecture does not appear until the Late Mississippian period, and little hard evidence of intensive corn agriculture exists in the archeological record. Pottery, which often bears record of Mississippian icons in other regions, displays little iconographic design in this portion of the Chattahoochee valley during the Early and Middle Mississippian periods.

Emergent or Early Mississippian Period (A.D. 900 to 1250). The Averett culture is an Early Mississippian culture whose most common "diagnostic" artifact type is a grit tempered ware, defined during the late 1950s and early 1960s by Chase from the Averett site in Muscogee County, Georgia (1958, 1959b, 1963b). Averett pottery is overwhelmingly undecorated, but brushed and incised pottery, and plain bowls with small appliquéd nodes on the shoulders are also associated with the Averett culture. Madison small triangular projectile points are associated with Emergent Mississippian sites in the region. Several Averett sites in the region have yielded Etowah Complicated Stamped pottery in sufficient quantities to suggest that Etowah motifs are an integral part of the Emergent Mississippian ceramic complex for the region.

In an earlier summary of Mississippian settlement in the lower Chattahoochee River region, Gail Schnell (1981) suggested that the Fall Line Hills region served as a barrier between the chiefdoms of Etowah and Rood. She did not consider construction of mounds an obvious trait of the Averett culture. She equated the lack of mound construction during this period with lower social complexity, compared with developments in other areas of the southeastern U.S.

Chase proposed an origin of A.D. 900 for Averett, but his Averett concept was greeted with some skepticism by the archaeological community. Chase recognized it as a distinct horizon on several excavated sites, although he lacked supporting radiocarbon dates. Excavations at the type site yielded refuse pits and two burials, including one accompanied by marine shell beads.

Excavations by Southeastern Archeological Services, Inc., at Florence Marina in Stewart County, Georgia, south of Fort Benning and at the Mill Creek site near Americus have yielded reliable radiocarbon dates for Averett, falling within Chase's predicted range and supporting his assertion that it was a Mississippian phenomenon in the region (Ledbetter and Braley 1989). Three uncorrected dates for Averett from Florence Marina range from A.D. 860 to 1020 (1090±70 B.P.; 990±60 B.P.; 930±80 B.P.). Averett sites are difficult to recognize since the most common artifact type associated with them are plain sherds, but Averett incised sherds are present in low frequencies in larger sherd collections. Averett incised is distinguishable from later Lamar incised wares by the lack of curvilinear design elements. Small triangular projectile points also are associated with Averett sites.

The replacement of Swift Creek designs with rather drab Averett wares represents quite a departure in ceramic expression within the Chattahoochee River valley. The mechanisms of this transition are not well understood. Further north, the transition from Swift Creek to Etowah followed a more predictable flow, but complicated stamped designs were a minor part of the Averett culture. The project area appears to lie within the heartland of the Averett culture, and Etowah sherds are present as a minority ware. The Carmouche site (9ME21) produced extensive evidence of the Averett culture (Gresham et al. 1985). Seven uncorrected radiocarbon dates for Averett components from the Carmouche site average A.D. 1127 (A.D. 90±80; A.D. 1,520±50; A.D. 1,430±70; A.D. 1,020±80; A.D. 1,170±60; A.D. 1,020±50; A.D. 830±60).

Similarities are noted between the Averett series and the Bibb series of the Macon Plateau culture in central Georgia. Although Bibb wares are shell tempered, plain surface treatment is common. Averett dates are roughly contemporaneous with Bibb and both may provide clues to adaptations in Alabama and Georgia during the Emergent Mississippian.

The chronological position of simple stamped and cord-marked wares is not well established for the region. Both decorative treatments are present at sites in the area as minority wares. Although often ascribed to the Woodland period, data accumulating in surrounding regions suggests that at least some of these wares date to the Mississippian period.

Elliott and Wynn (1991) proposed that Vining Simple Stamped, a long-abandoned type conceived by A. R. Kelly during the mid 1930s, be resurrected and applied to a class of wares in the Georgia Piedmont. They suggest that Vinings wares may date from the Late Woodland as late as the Early Mississippian period, and may represent a distinct cultural ceramic tradition. Wynn and his colleagues conducted excavations at a suspected Vinings site in Putnam County, Georgia, and found good evidence of the use of simple stamped wares with small Madison triangular points. Williams reports finding simple stamped wares and small Madison triangular points in premound levels at several Mississippian mounds on the Oconee River, which hints at the existence of a Vining phase. While lacking radiocarbon dates, the resurrection of Kelly's Vining concept deserves consideration (Wynn and Bruce 1990).

Several excavations on the Flint River drainage shed light on the Early Mississippian period for the area east of the project. A Mississippian period burial excavated by the Columbus Museum of Arts and Sciences on the lower Flint River drainage, associated with cord-marked pottery and small triangular points, was radiocarbon dated to A.D. 1,225±65. This find is important because it indicates a previously unrecognized late cord-marked ware. This ware has not been formally defined (Schnell 1975).

Excavations at the Mill Creek site near Americus also yielded evidence of Averett ceramics in Emergent Mississippian contexts (Gresham et al. 1989). Mill Creek also yielded a significant percentage of cord-marked pottery, but no simple stamped wares. The Mill Creek site excavations revealed an Early Mississippian ceramic assemblage dominated by Averett Plain (74.6 percent) with minor amounts of Averett Incised (0.4

percent) and Etowah Complicated Stamped (3.3 percent) (Gresham and Ledbetter 1989:7).

Worth and Duke (1991:36) reported on excavations at Hogcrawl Creek on the Flint River that possessed many of the characteristics of Vinings, including the association of simple stamped ware with small triangular projectile points, but no radiocarbon dates were available from this site. They propose the Lester phase (A.D. 900–1150) for the Early Mississippian period on the Flint River, which is followed by the Late Etowah Brunson phase. The Lester phase is characterized by predominantly plain (88 percent) pottery with minor amounts of simple stamped (10 percent) and incised (2 percent).

Anderson's work on the upper Savannah River at the Ruckers Bottom site in Elbert County, Georgia, lends additional credence to a simple stamped ceramic tradition during the Emergent Mississippian. He provides radiocarbon dates to support this association (Anderson 1985; Anderson et al. 1982; Anderson and Joseph 1988).

Excavation on the Sandy Hammock site in south-central Georgia also yielded solid Mississippian dates (A.D. 1281, 669±47 B.P. [UGA-6019]) for cord-marked ceramics (Stephenson et al. 1991). Stephenson's data is particularly convincing, since the charcoal submitted for accelerator method dating (AMS) was soot taken from the exterior of the vessel.

Middle Mississippian Period (A.D. 1250 to 1400). Middle Mississippian period sites in the region are identified by traits associated with the Rood's Phase. The Rood's Creek site (or Rood's Landing), a multiple mound site partially excavated by Joseph Caldwell and located in the middle section of Walter F. George Reservoir, was likely the core of a chiefdom whose sphere of influence barely reached the area (Caldwell 1955). Caldwell's excavations were confined to the mound summits and no village areas were sampled. Several buildings were identified by Caldwell, including rectangular, square, and "teardrop" styles. Plain, fingernail punctated, and Rood's Incised pottery was recovered from the mounds, as were Cartersville Check Stamped, Fort Walton, Lamar Complicated Stamped, Lamar Plain, Mercier Check Stamped, and Pinellas sherds. Caldwell identified an early, middle, and late period occupation sequence at Rood's Creek. The premound level at the Rood's Creek site was composed of shell tempered and grit tempered sherds, but the sample size was too small to make definitive statements about this period. The intermediate occupation at Rood's Creek was dominated by plain, grit tempered ware, frequently with handles. Notches, nodes, and incisions (arched parallel lines) also were noted. The latest occupation was characterized by predominantly plain pottery, often shell tempered, and occasionally decorated with loop or strap handles and incised and punctated designs. Caldwell noted a resemblance between the Rood's Creek pottery and the Bibb series, and he suspected that Rood's Creek may also be an intrusive culture.

Jenkins (1978:74) recognized a Rood's Creek I, II, and III cultural sequence for the lower Chattahoochee valley, with Rood's Creek III coeval with the Bull Creek phase. His Rood's Creek I culture began around A.D. 900, followed by Rood's Creek II at A.D. 1200 and Rood's Creek III around A.D. 1300. Walthall (1980:38–193) places the span of the Rood's sequence from A.D. 1200 to 1500. Excavations at the Carmouche site (9ME21)

produced definite evidence of this culture (Gresham et al. 1985). The preference for the Chattahoochee River floodplain may reflect a floodplain agricultural subsistence strategy, or it may signify a need to maintain settlements along a major water transportation route. Two outlying Middle Mississippian sites are on the Upatoi Creek drainage, one of which is the Carmouche site.

Late Mississippian Period (A.D. 1400 to 1550). Fort Walton pottery, a Florida type, has been identified in low frequency on several sites in the region, and it may represent trade ware. Fort Walton Punctated and Pinellas Incised are reported from the region. Some Fort Walton culture sites in Florida contain European trade material, but others do not. Willey interpreted Fort Walton as an intrusive culture into Florida ancestral to the Apalachee and other southern Muskogean speakers, but Griffin sees continuity with the previous Weeden Island culture. Excavations at the Carmouche site (9ME21) on Fort Benning produced a number of examples of Fort Walton pottery (Caldwell 1955; Gresham et al. 1985; Griffin 1950; Scarry 1985; Willey 1949; Willey and Woodbury 1942). The Bull Creek focus of the Lamar culture is centered immediately north of Fort Benning on Bull Creek in Muscogee County, Georgia. The particulars of the Bull Creek focus have not been well expressed in the literature, despite repeated excavation on the Bull Creek site since the 1930s. Lamar pottery is a grit tempered series that includes Lamar Plain, Lamar Complicated Stamped, and Lamar Bold Incised.

Schnell characterized the Bull Creek (Lamar) phase, for the period A.D. 1400–1475, as having pottery assemblages composed of approximately 60 percent complicated stamped, 35 percent plain, and less than four percent incised or punctated surface treatments; in addition to the presence of coarse grit tempering, Mercier Check Stamped sherds, and negative painted dog effigies. Houses from the period are square and burials predominantly lack grave goods (74 percent) (Schnell 1990a).

Schnell (1990a) has defined the next Lamar phase as Stewart, lasting from A.D. 1475 to 1550. Slightly more than half (55 percent) of the pottery on Stewart phase sites is undecorated, and complicated stamped pottery declines in frequency to about 20 percent, while incising and punctating increase to about 15 percent. Coarse grit tempering and Meraer Check Stamped pottery continues to be present. Square and rectangular houses are known from the period, but burials are almost unknown (only two are documented from Rood's Creek, Mound A).

THE PROTOHISTORIC AND HISTORIC PERIODS

The beginning of the historic period in the United States varies from region to region, and is dependent upon the-presence of literate societies in the region. The transition from preliterate to literate societies in the southeastern United States is classified as the Protohistoric period. The earliest historical accounts of the Native Americans of the Southeastern United States come from the de Soto expedition of 1540, which marks the start date of the Protohistoric period in the area.

Protohistoric Period and Historic Aboriginal Period (A.D. 1540 to 1835)

Lamar pottery continued to be produced in the years following European contact, and in most areas of the southeastern U.S., it is difficult to distinguish between prehistoric and protohistoric Lamar assemblages, especially if no Spanish trade material is recovered. The absence of European artifacts does not necessarily mean that a Lamar site is prehistoric, particularly when small surface collections are the subject of study. Consequently, there are many late aboriginal sites that cannot be definitively placed into a prehistoric or protohistoric category.

Jenkins (1978:74) defines the earliest Lamar phase of the protohistoric period as the Abercrombie phase. Schnell places the date for Abercrombie at A.D. 1550–1625 (Schnell 1990b). Pottery from the period includes predominantly plain shell and grit tempered ware with large amounts of burnished, smoothed, polished, and black filmed ware. Shell tempering is common during this period and plain shell tempered wares on some sites have been identified as Dallas or Mouse Creek. Interaction or actual movement of people from the Tennessee River valley has been suggested during this period. Complicated stamped designs continue to decline in popularity, while incising and punctating become more common. Houses from the period may include semi-subterranean buildings. A variety of burial forms are known, and burial goods, including sixteenth- and seventeenth- century Spanish trade items, increase in frequency of occurrence.

The Blackmon phase, or Ocmulgee Fields I (A.D. 1625–1715), is characterized by a continuation of the lifeways of the Abercrombie phase, but with shell tempered pottery with design motifs similar to Ocmulgee Fields types. Shell tempering is common during this period. Walnut Roughened and Kasita Red Filmed pottery types are present, but the grit-tempered Chattahoochee Brushed type is absent. Excavations at the Blackmon site in Walter F. George Reservoir revealed features with Spanish trade material and aboriginal pottery. Braley (1991) has identified a Blackmon phase component at Yuchi Town (1RU63), which includes burials with Spanish trade material.

The earliest contact of European peoples with the Native American groups of the interior of Alabama was the de Soto expedition of 1540 and subsequent Spanish explorations in the mid sixteenth century. Although there is no evidence that these expeditions passed through what is now Russell County, the results of contact with native groups in the area, including altered trade patterns, disease, and political upheaval, affected all of the native peoples of the Southeast. For the next century there was little to no contact with the interior tribes.

In 1670, the British established the colony of Carolina at Charles Towne, and this event had enormous impact on the aboriginal cultures within the area. The Spanish lock on the aboriginal groups of the Chattahoochee Valley was broken in the first decade of the eighteenth century when Col. James Moore led a military campaign that resulted in the destruction of the Spanish-allied Apalachee chiefdom, to which the groups in the area paid tribute. The British initiated a deer skin trade and a trading post was established on the Ocmulgee River (Kelly 1938). The creation of the trading post caused many of the inhabitants of the Chattahoochee River valley to move east to be closer to the trade. This

trade continued unabated until the Yamassee uprising in 1715–1719, when the trading post at Macon was abandoned.

Following the Yamassee War, the Creek and Yuchi moved back to the Chattahoochee valley where they reestablished many of the old towns, although not necessarily on the same spot. The establishment of Fort Toulouse by the French near present-day Montgomery presented an alternate source of trade, but this trade was dominated by the Upper Creeks who lived near Fort Toulouse. British traders continued to court the Lower Creeks, despite the great distance from Charleston.

Hoping to establish a barrier colony between the Carolinas and Spanish Florida, the British crown granted a charter to James Oglethorpe in 1732, who in 1733 founded his Georgia colony at Savannah. After driving the Spanish off the Georgia coast, Oglethorpe traveled to Coweta, on the Chattahoochee around what is now Columbus, to negotiate a treaty for lands on the east coast of Georgia, which the Creeks claimed. Visitors to the area in eighteenth century described a fairly closely settled collection of towns on both sides of the river that were loosely affiliated with the Lower Creek Confederacy. Established trading paths were used by white traders to travel to the region and barter for goods. Often, these Euro-American traders established permanent of semi-permanent residences within Native American territory. Some of these occupations may have been in Russell County, although none has been identified.

Following the Revolutionary War, many soldiers moved into Indian territory based on government land grants. Uneasy relations existed between the Creeks and the citizens and government of Georgia during the latter part of the eighteenth and the first quarter of the nineteenth century. Under pressure to secure further cessions of land from the Creeks, the state negotiated dubious treaties that were not supported by all Creeks.

When the United States purchased Louisiana in 1803, the idea of a road from Washington, D.C. to New Orleans through the southern states and Creek territory was discussed. In 1804, an agreement was made through the Indian Agent Benjamin Hawkins to allow passage through the territory along an existing Indian trail that would be improved to a horse path. The trail followed the ridgeline south of Upatoi Creek in Georgia, crossing the river at the westernmost point of the prominent bend at Fort Mitchell, Alabama, about 6 miles south of the project area. The Creeks were directed to keep ferries and taverns along the path. In 1811, the path was improved to a wagon road and portions were rerouted. At that time, a ferry was established at Hall's Upper Landing, a short distance north of the former crossing. Despite these improvements, travel along the road was difficult, and the route remained a road through the wilderness until the second quarter of the nineteenth century. As the territory was settled and other roads built, the old federal road was slowly abandoned, and little evidence of the old route remains today (Russell County Historical Commission [RCHC] 1982:C-34- 35).

Increased hostility toward Americans among the militant "Red Stick" faction of the Upper Creeks and promises of support by the British for attacks against American settlements led to the establishment of Fort Mitchell near the ferry over the

Chattahoochee on the Federal Road in Russell County in 1813. A Lower Creek trading house, or "factory," was located at Fort Mitchell from 1817 to 1820.

In 1825, William McIntosh, a chief of the Lower Creeks, ceded the remaining territory of the Creeks in Georgia under the terms of the Treaty of Indian Springs. This left only a small portion of east-central Alabama as the last land of the Creeks east of the Mississippi. Many Creeks opposed the treaty, and McIntosh was assassinated for his betrayal. The town of Columbus, located at the head of navigation on the Chattahoochee River in Georgia, developed rapidly after the cession, bringing settlers and fortune seekers to the area and making the Chattahoochee River a tense barrier between American settlers and the Creeks remaining in the Alabama territory. About the same time, the southern boundary of the Creek territory in Alabama was moved northward to run on a line between Fort Mitchell and Fort Jackson on the Coosa River near Montgomery. The area south of the fort was made a part of Pike County, further encroaching on Creek settlements.

In 1832, the Creeks were finally forced to cede their last remaining lands in Alabama and were to be relocated west of the Mississippi. In 1835, a band of Creeks organized to resist the removal, leading to the reoccupation of Fort Mitchell. Bands of Creek warriors attacked settlers moving onto lands across the Chattahoochee, and several steamboats were attacked as they made their way up the river. Refugees from the new territory sought protection at Fort Mitchell, and hundreds of Creek warriors, women and children that were captured, were held prisoner there. As it became clear that the resistance would fail, many others turned themselves in at the fort. In 1836, over 14,000 Creeks made their way to Oklahoma, many of them leaving from Fort Mitchell. This marked the end of any significant Native American presence in Russell County.

The aboriginal pottery from the period A.D. 1715–1835 is dominated by Chattahoochee Brushed pottery, with lesser amounts of Kasita Red Filmed and Ocmulgee Fields Incised (a fine line incised ware). Chattahoochee Brushed grit tempered pottery is, by far, the foremost diagnostic artifact found on historic Creek sites within the area. Coarse and fine plain pottery also is common during this period. Filleted rims also are common. Schnell has suggested that Kasita Red Filmed pottery was a marker used to reinforce tribal differences between the Upper and Lower Creeks. This decorative treatment is not common on sites in the Montgomery area where the Upper Creek presence was strongest. The frequency of European trade material also increased markedly during the eighteenth century.

Historical Development of Russell County

Russell County was created in 1832 from the final Creek cession. The southern portion of what is now Russell County was a part of Barbour County until 1866 (RCHC 1982:C-48). Intrusion into this area by Europeans began in the early 1800s with the construction of the federal road to New Orleans that passed through Fort Mitchell, and traders and other pioneers have been documented in the county from at least 1817 (Owen 1978:119). One of the earliest known homesteads in Russell County was established by James Elizabeth Glenn, who moved from Abbeville, South Carolina to Stewart County, Georgia

in 1832. In that year he farmed land on the Alabama side of the river, which he rented from the Creeks. In 1833 he moved to an Indian village on Hatchechubbee Creek near the present town of Pittsview. He lived at this site for a few years, purchasing land from the Creeks on which he planned to build his homestead and a church. Around 1835 he built a log cabin at the site of what would become the community of Glenville (RCHC 1982:C-31). During the Creek resistance in 1835–1836, Glenn was forced to abandon his home and flee to the safety of Columbus, but he returned to rebuild his home and establish the settlement of Glenville (RCHC 1982:C-31; Walker 1950:126).

After the threat of Indian trouble had been removed, organized, permanent settlement of what is now Russell County could begin. Most of the settlers were farmers and raised cotton, corn, sweet potatoes, and a few other crops, as well as livestock. In this way, most of the food supplies for the farm were grown on the land, with cotton sold for cash to acquire store-bought items such as coffee, sugar, salt, and spices.

Antebellum community life centered on small villages and crossroads settlements that served the social and economic needs of the local farmers. Churches, post offices, mills, and stores formed the nuclei of these communities. On the plantations, the boat landing or central farm complex likely served the same function, although trips were often made to town to conduct business and socialize.

The busiest settlements in the area in the early years were located along the Chattahoochee River, where settlers could bring their farm products for shipment and shop for merchandise that they could not produce at home. In Russell County, a number of communities developed across the river from Columbus, which was becoming a major city as a result of textile mills built along the river. The oldest settlement on the Alabama side of the river was known as Girard (RCHC 1982:C 69).

The town of Seale in Russell County was also settled early in the county's history and was originally known as Peru. It was located close to the early federal road through the county and was probably settled soon after 1832. The town moved south about two miles in the 1850s when the Mobile and Girard Railroad was constructed. The new village was known as Silver Run after the creek located there and, as the railroad's terminus for two years, prospered as a commercial and cultural center. The town was incorporated as Seale in 1871 (RCHC 1982:C40).

The basis of the area's economy was cotton, and large plantations developed rapidly as immigrants from Virginia, the Carolinas, and Georgia began their farms based on the models established in the seaboard states (Walker 1941). The importance of the plantation system is reflected in the population figures of Russell County, where by 1840, only eight years after the Creek Treaty, blacks outnumbered whites. Of the 26,594 residents of Russell County on the eve of the Civil War, 58.8 percent were black (Owen 1978). There were 1,044 slaveholders in the county, more than one for every farm, and the average slaveholding was nearly 15 bondsmen. The large plantations skew this number upward, however. Even with the large number of slaveholders, over 70 percent held 10 or fewer slaves. Since there were more slaveholders than farms, it is likely that some of the slave owners operated as labor brokers, hiring out slaves to farms where they

were needed. Others may have employed slave labor at brick yards, cotton factories, or sawmills. There were also likely some slave owners who were town residents or owned slaves inherited from a family member (Kennedy 1860a, 1860b).

Although there was some sentiment in the region for preserving the Union, most residents felt strongly about states' rights. When war was declared, many of the men of the Barbour and Russell counties left their farms and plantations to defend those rights. The plantations were greatly disrupted by the absence of owners, managers, and overseers, and the remaining residents struggled to make ends meet. The war did not arrive in this part of Alabama until 1865. General Wilson's cavalry was making its famous raids across the state, destroying Confederate factories and other supporting operations. A nail factory at Girard and a number of important industries in Columbus were targeted by Wilson, and he arrived from Montgomery on the sixteenth of April. There were no regular soldiers stationed at Columbus, and the collection of mill workers and militia from the surrounding countryside who attempted to defend the city were no match for Wilson's superior numbers and experienced troops (RCHC 1982:C 44-45). The Battle of Girard, one of the last engagements of the Civil War, resulted in massive destruction of Columbus's industry (Walker 1950:275). On April 29, 1865, General Benjamin H. Grierson's Cavalry arrived outside Eufaula only to hear the news of Johnston's surrender, which ended the war. Grierson's men were kept under control, and the town was not looted or destroyed (Walker 1941:202-205).

Like much of the rest of the South, Russell County suffered through a period of economic and political confusion following the war. Restless freedmen often left their home plantations for the major cities, seeking family or a better way of life. Corrupt military and civil authorities sought to make the most of the disorder, and money for business ventures was difficult to find. Shifting fortunes, combined with rapid changes brought by the railroads and other technological advances, altered the landscape of the plantation South, and many prosperous towns from before the war faded into obscurity, while thriving new commercial centers rose to prominence. Among the towns that faded were Uchee, Glennville, and Rutherford in Russell County (RCHC 1982:C-39,41,80-81).

The boundary of Russell County changed significantly in 1866, when the county line was shifted some four miles west of Glennville. The population of Russell County in 1870 consisted of 21,636 persons. It had risen to 24,837 by 1880, but had declined slightly by 1890 to 24,093. Throughout the historic period, blacks greatly outnumbered whites; during the post-Civil War period the discrepancy was magnified, with blacks outnumbering whites by more than three to one (Berney 1892:63-64).

Having secured railroad connections prior to the war, the town of Silver Run, soon to be known as Seale, campaigned after the war to be the county seat. It was selected in 1868, and work began on the courthouse that still stands in the town. Located on a prominent knoll, the impressive courthouse is the third oldest in the state. Academies for boys and girls were established there which enjoyed excellent reputations. The town was a commercial, civic, and cultural center during the late nineteenth century (RCHC 1982:C 73-81).

The community that is now Phenix City also benefited from the river trade, although it remained somewhat in the shadow of Columbus on the Georgia side of the river. Two main settlements existed across from Columbus, one called Girard and one known as Brownsville. Brownsville was the home of Phoenix Mills, and its associated village of Phoenix. The area grew rapidly during the early twentieth century, and in 1923 the various communities were united as Phenix City. In 1935 the county seat was moved from Seale to Phenix City, which by that time included more than half the population of the county (RCHC 1982:C67-71).

The town of Pittsview is relatively young, having grown up around the railroad built in the early 1890s, and originally known as Pittsboro. The town superseded the village of Dexter, about four miles to the north on Watermelon Creek, which ceased to exist soon after the railroad was built. The area was settled in the 1830s, and the early name of Cool Springs still persists, but no significant town existed there until Pittsboro. Having the advantage of railroad connections, Pittsview replaced the post office at Glennville, and the town has served as the commercial center for the surrounding rural countryside in the twentieth century, while Glennville has slowly disappeared (RCHC 1982:C72-73). Pittsview was described by one author in these glowing, albeit biased terms: "Since its beginning, Pittsview has had a proclivity to an abundant social life. Entertaining has been the rule rather than the exception and hospitality all over town is bounteous and charming" (RCHC 1982:C73).

Although Phenix City grew rapidly during the twentieth century, the character of the surrounding county remained decidedly rural. Phenix City served as a trade center for local farmers, who still preferred cotton as their primary cash crop. The demise of the plantation system led to steadily decreasing farm size and increasing tenancy during the early twentieth century. Despite the often wildly fluctuating price of cotton, it was familiar to grow and easy to store, and many landlords refused to take payment from tenants in any other form. The tenant system tended to keep farmers in debt, with little chance of saving enough money to purchase farms of their own. In 1910, of the 2,986 farms in the county, only 20 percent were operated by the owners (Owen 1978). In 1890 Russell County contained more than 99,274 acres of cultivated land, roughly 23 percent of the county, including 66,772 acres in cotton and 32,502 acres in corn. Land prices at that time ranged from $2.50 to $25.00 per ace (Berney 1892:325).

Programs instituted at the state and national levels during the 1930s and 1940s were responsible for improved roads and bridges as well as improved agricultural practices in rural Alabama. Both efforts were instrumental in broadening the inflexible cotton economy of the previous 100 years. Health and education programs were also launched to improve the quality of life for Alabama's rural poor (Walker 1941:336–339). Rural electrification brought power to rural Russell County in the 1930s, providing health and quality of life benefits, as well as jobs in the Chattahoochee valley (Walker 1950:549).

Beginning with the establishment of the U.S. Army Infantry School at Camp Benning in 1918, the presence of a large military population in the Columbus area has affected Russell County, both positively and negatively. The construction of such a large facility, which took place in several episodes, provided much needed jobs in the agriculturally

depressed region. During the 1930s, large numbers of buildings were constructed with WPA and Public Works Administration laborers. A Civilian Conservation Corps camp was established at Fort Benning in 1933 (Elliott et al. 1995:165–170).

The large number of common soldiers congregated in one place also led to the proliferation of bootlegging, gambling, and prostitution, particularly in Phenix City, which had been infamous for corruption and vice even before the base was built. The town was so notorious that Gen. George S. Patton threatened to take his tanks across the river and flatten the place, and Secretary of War Henry L. Stimson called it the "wickedest city in America." In 1954, Albert F. Patterson was elected Alabama Attorney General on a platform of cleaning up "Sin City," but was gunned down in the town before he could take office. The assassination led to a declaration of martial law and a successful reform effort, and by the end of the year, the syndicate that controlled the town had been shut down (*Time Magazine* 1962).

Phenix City slowly recovered from the shuttering of its underground economy, and by the early 1960s was celebrating the opening of a modern shopping center, groundbreaking on a new port facility, and the completion of numerous public buildings, including a municipal center, two fire stations, a post office, a bridge, and a new sewer system (*Time Magazine* 1962).

History of the Project Area

The project area is located approximately 3 miles southwest of Phenix City, east of the intersection of Seale Road and SR 165. The Phenix City campus of Troy University, formerly Troy State University, is located across Seale Road, to the north of the site. Seale Road was formerly the main route between Phenix City and the community of Seale, which served as the county seat until 1935. Between 1964 and 1968 a bypass of Phenix City was constructed that diverted traffic on U.S. 431 away from Seale Road north of the project area. Wilson's Pond, to the north of the site, was constructed between 1950 and 1954 (Alabama State Highway Department [ASHD] 1954, 1964; USGS 1950, 1955, 1968).

The first detailed map of the project vicinity is the 1913 U.S. Department of Agriculture soil map of Russell County (USDA 1913) shown in Figure 11. It shows the original route of Seale Road (U.S. 431), the remnant of which is shown as a dotted line on the current USGS map (see Figure 1) to the northwest of the project area. There were a number of structures along the north side of the road at this bend, none of which appear to be extant. Other structures near the project area at that time were located on what is now SR 165 to the west of the project area.

The next view of the project vicinity comes from the 1937 highway map of the county (Alabama State Highway Department [ASHD] 1937). By this time Seale Road had been rerouted and improved as a U.S. Highway, with the original road still shown to the south of the reroute (Figure 12). A loosely settled community is evident from the buildings around the intersection of U.S. 431 and SR 165. These include two churches, a school, and several stores, along with dwellings and farm units.

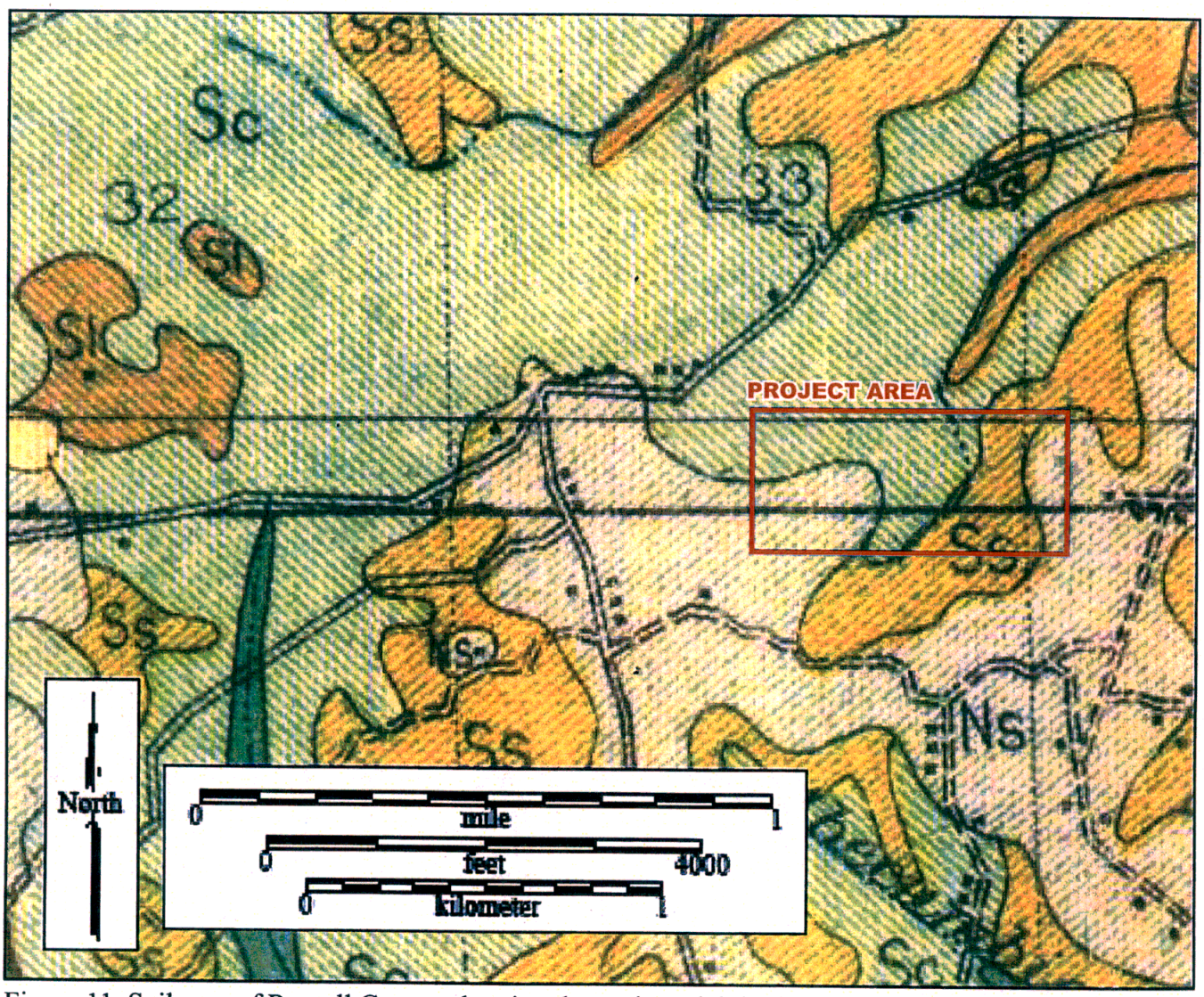


Figure 11. Soil map of Russell County showing the project vicinity in 1913 (USDA 1913).

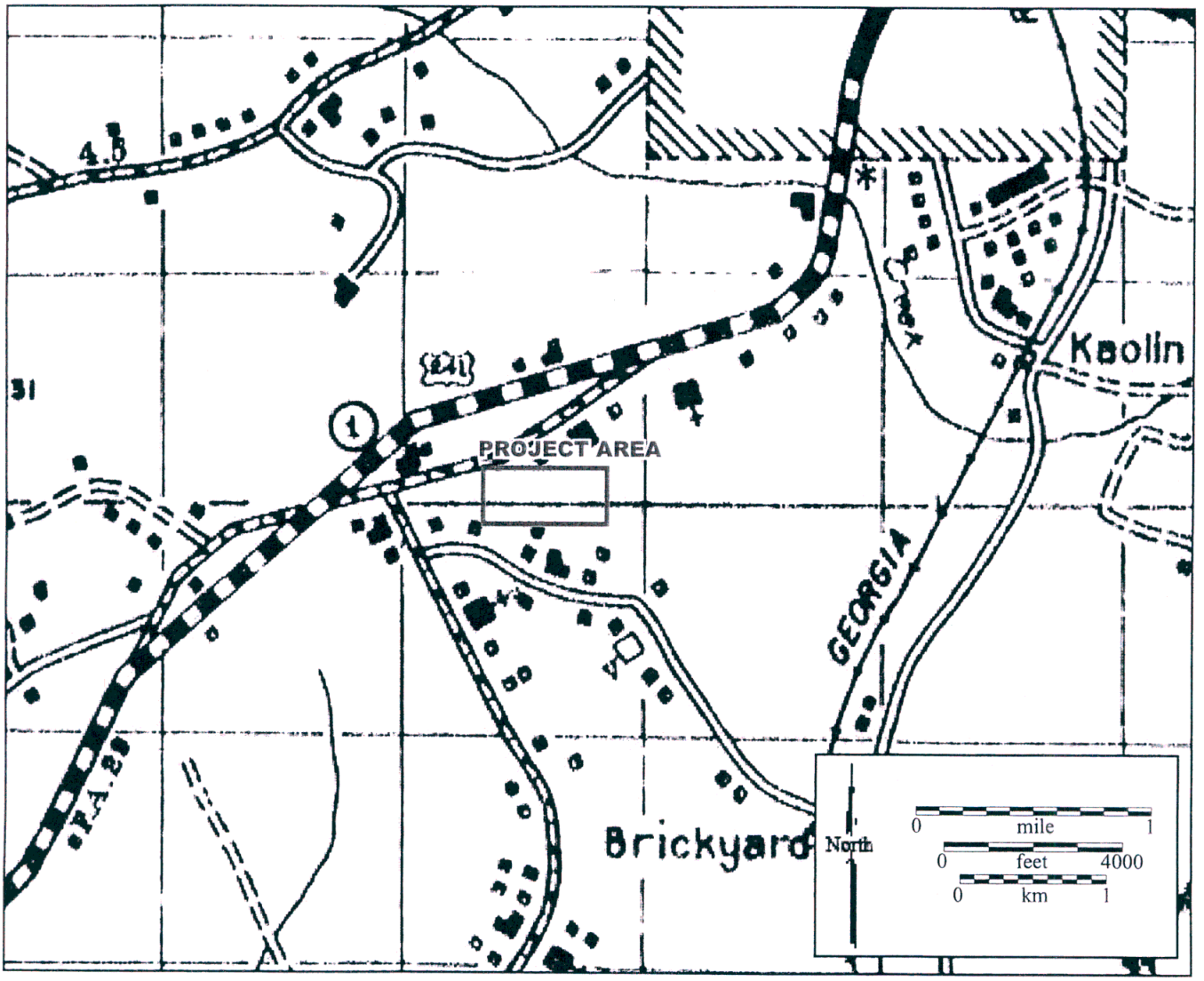


Figure 12. Highway map of Russell County showing the project vicinity in 1937 (ASHD 1937).

By 1950, the old route of Seale Road is no longer shown on the county highway map (ASHD 1950), although a portion is shown on the USGS map of the same year (USGS 1950). The highway map shows considerable change to the area from 1937 as properties had become oriented to the new highway and farm dwellings had mostly given way to non-farm residences and businesses (Figure 13). The store on the old section of Seale Road appears to have been abandoned, with a new one constructed to the east. Structures near the project area were clustered around the intersection of U.S. 431 and SR 165, as well as on what are now Abercrombie and Lonesome Pine roads to the southwest of the project area. No structures appear to be within the project area.

Figure 14 shows the USGS map of the project vicinity in 1955, indicating the location of structures that might be 50 years of age or older. The same clusters of buildings are shown as in 1950, along with a row of structures along the south side of U.S. 431 to the northeast of the project area around Seale Road Church. These were not shown on the 1950 map because they were inside the city limits of Phenix City, which is not shown in detail. Wilson's Pond, to the north of the project area is shown for the first time on this map. No structures are shown within the project area.

A 1964 highway map (ASHD 1964) indicates that U.S. 431 had been further improved and straightened. By 1968, the U.S. 431 bypass had been constructed. No structures are shown in the project area on any of the other available highway or topographic maps for the second half of the twentieth century (State of Alabama Highway Department 1975; USGS 1968, 1973).

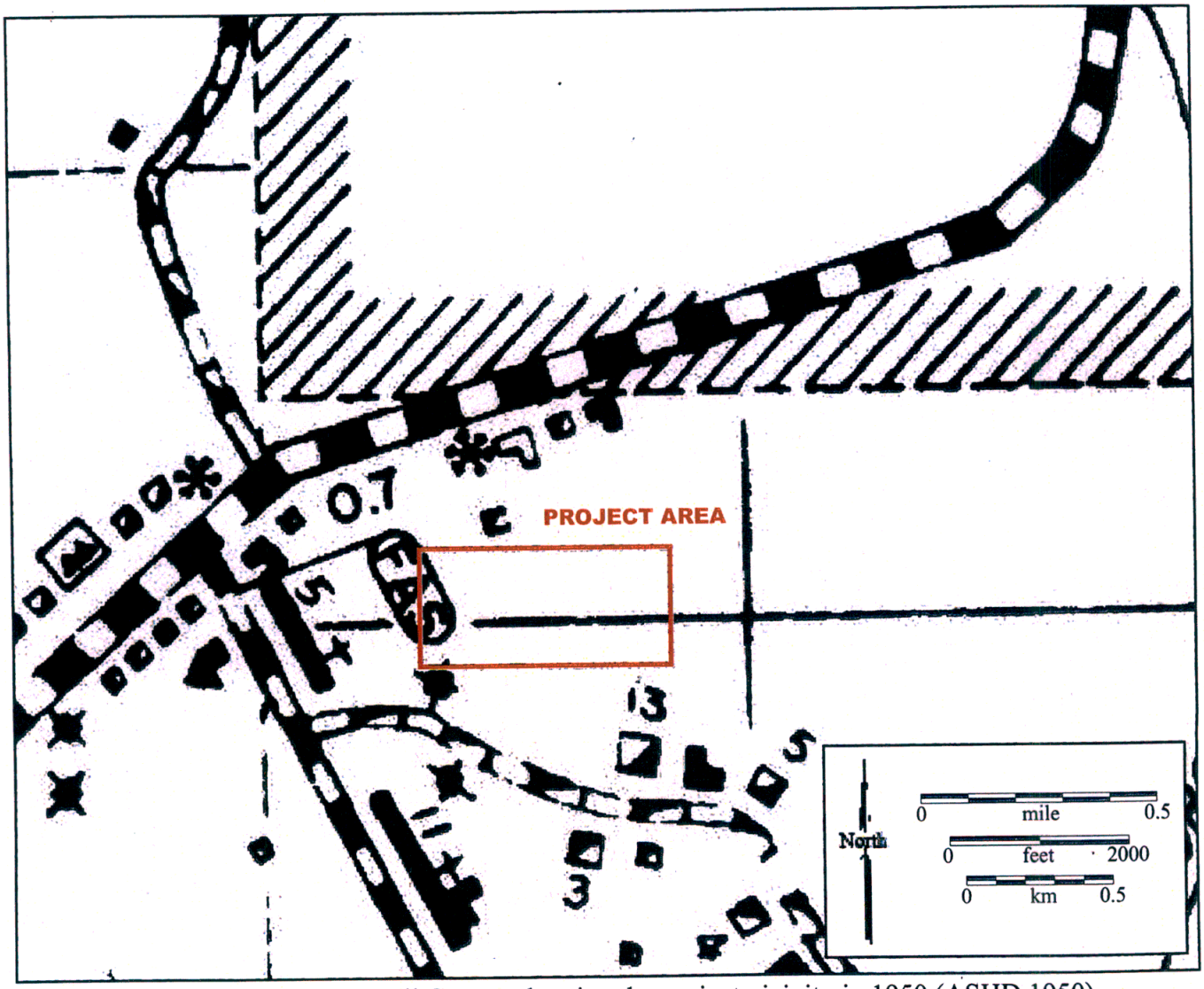


Figure 13. Highway map of Russell County showing the project vicinity in 1950 (ASHD 1950).

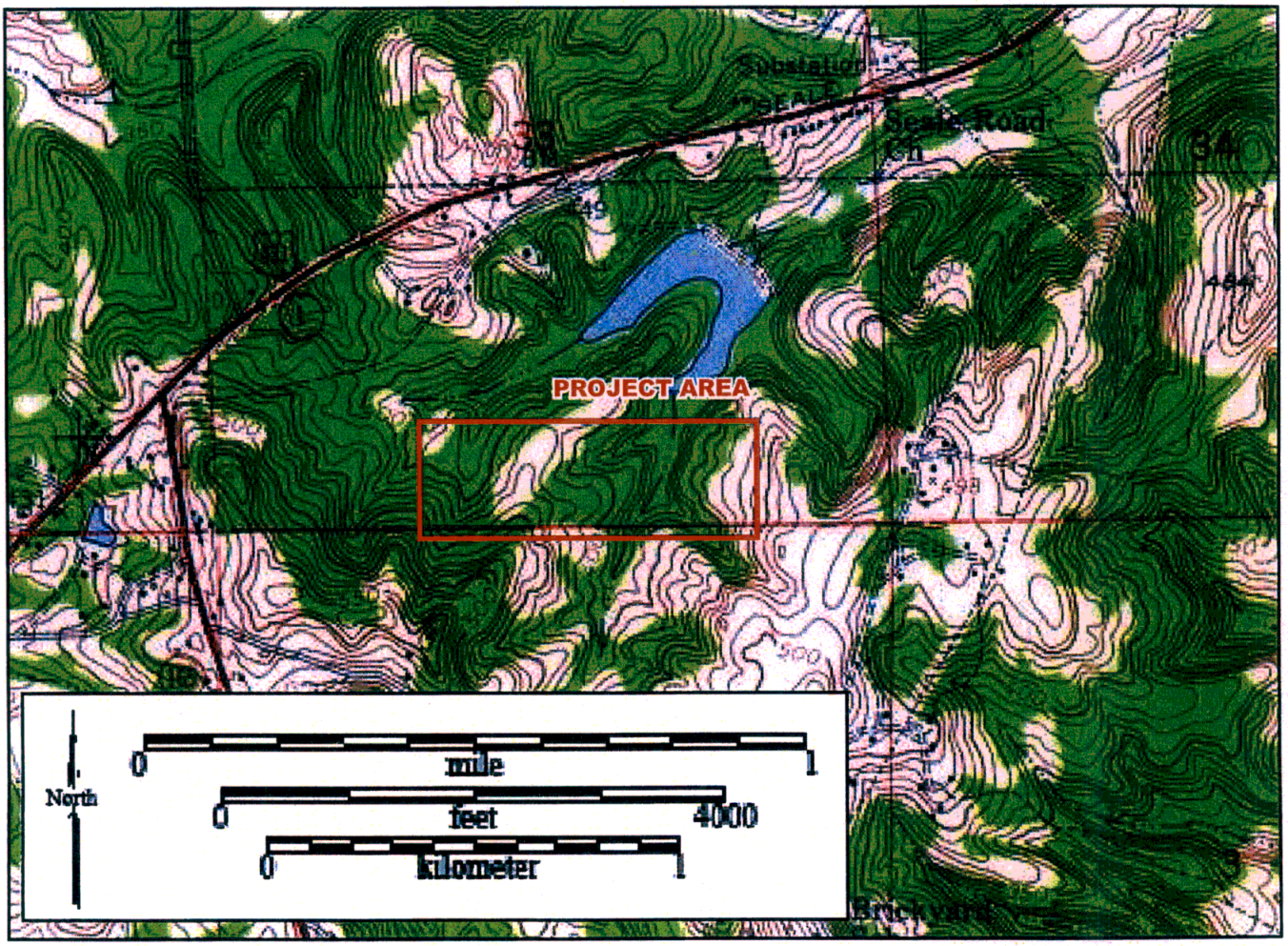


Figure 14. USGS topographic map showing the project vicinity in 1955 (USGS 1955).

IV. METHODS

ARCHAEOLOGICAL FIELD METHODS

The archaeological field survey was accomplished by pedestrian coverage of the survey tract. Systematic shovel testing was used where appropriate. Shovel testing generally was not implemented in severely disturbed areas or locations exhibiting a slope greater than 10 percent. In all other areas, shovel tests were excavated at 30-m intervals, or in the next undisturbed location. Shovel tests had a diameter of 30 cm and they were excavated to sterile subsoil or to a depth of 75–100 cm below surface. Soils were screened through 0.64-cm (¼-inch) hardware cloth to consistently recover any artifacts present. Descriptions for shovel and auger tests were made that included depth, content, soil color, and soil consistency.

Of 229 potential shovel test locations, 129 (56 percent) were not excavated to slope and/or heavy disturbances due to logging and grubbing. However shovel test locations on ground exhibiting less than 10 percent slope in highly disturbed areas were excavated and surface inspected (Figure 15). The dirt road along the southern side of the survey tract is near but does not form the actual southern boundary of the tract. Boundary markers can be seen from 10 to 20 feet south of the dirt road. This narrow strip was not shovel tested because it was mostly occupied by push piles and debris from the adjacent landfill.

Because soil profiles from one shovel test to the next usually differed greatly, and the majority of shovel tests exhibited subsoil at 5–20 cm below surface, descriptions of "typical" soil profiles have limited value. Given the general displacement of topsoil observed across the tract, only eight shovel tests were excavated to 30–40 cm, and three shovel tests were excavated to 75–80 cm. The latter consisted of loamy pale brown (10YR 6/4) sand over red (2.5YR 4/8) sandy clay subsoil. All of the shovel tests indicated disturbed soils or soils that had washed in from the slopes above them. It cannot be said that any of the shovel tests conformed with the descriptions of the Troup-Springhill-Luverne complex described by the Soil Survey for this tract.

HISTORIC STRUCTURES SURVEY METHODS

For the purpose of the historic structures survey, an area within 0.5 miles of the project boundary was examined on historic maps and aerial photography to identify the areas and structures that might be visually linked to the proposed landfill extension. These structures areas and structures were then visited. Based on the existing terrain and vegetation the APE was redefined as the study area plus surrounding vegetative screens. The forested area around the project tract restricts the view of the proposed landfill extension from the developed areas to the northwest and southwest. None of the proposed landfill extension is visible from these areas due to the terrain and vegetation.

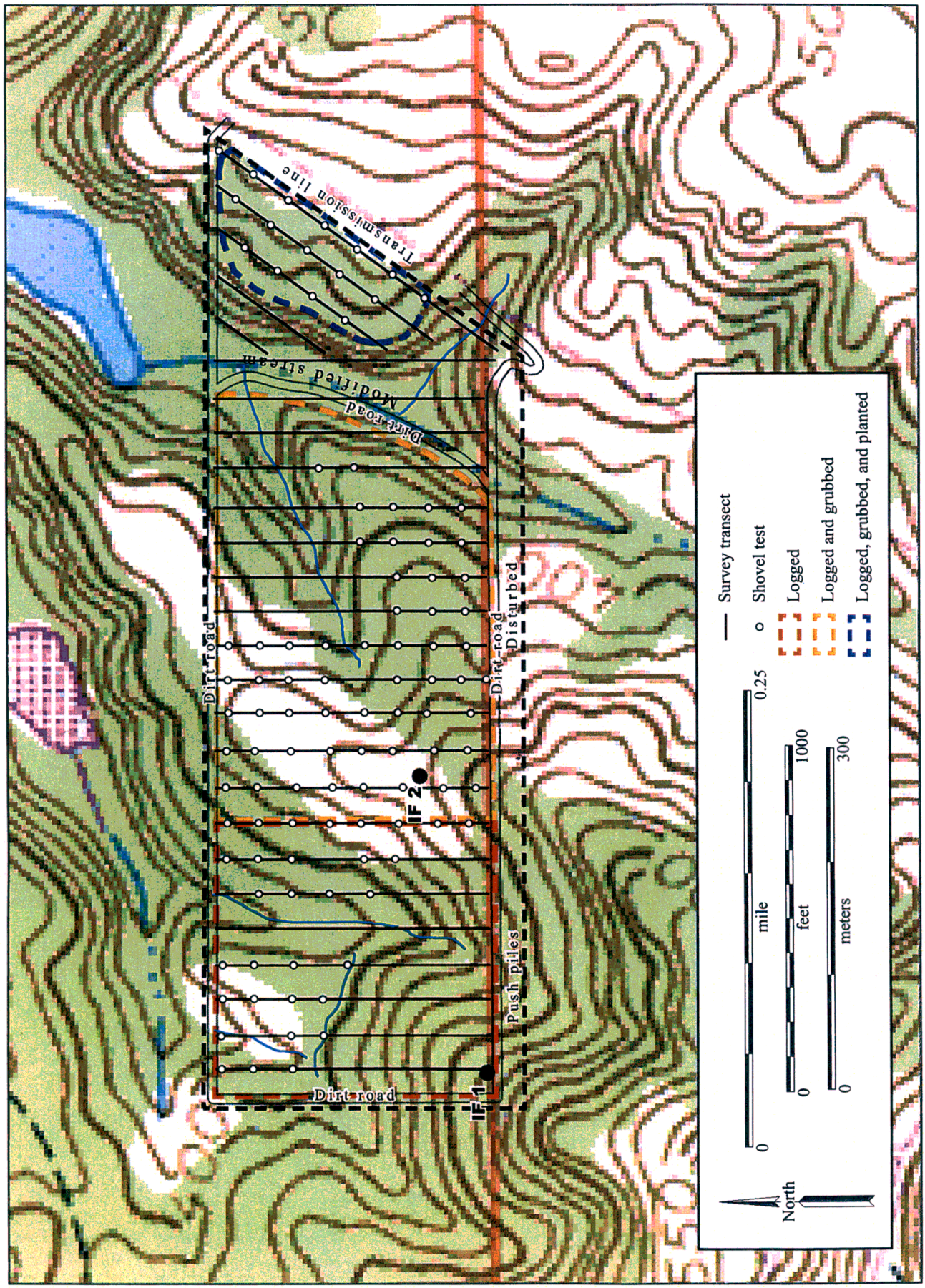


Figure 15. Archaeological survey coverage.

LABORATORY METHODS AND CURATION OF PROJECT MATERIALS

Following the fieldwork phase, all artifacts and project records were returned to the TRC laboratory in Atlanta. The artifacts were washed and labeled. They consisted of a piece of lithic debitage and one hafted biface fragment. All were described as to raw material, the debitage was identified according to lithic reduction stage, and an attempt was made to describe and identify the hafted biface, but unfortunately it is too fragmentary and not diagnostic.

The artifacts, field notes, maps, photographs, and other technical materials generated as a result of this survey will be temporarily curated at TRC's Atlanta office until completion of the review process. The University of Alabama Museums' Office of Archaeological Research at Moundville will be used as a permanent repository for the collection.

V. RESULTS

The background literature and records search conducted prior to commencement of field studies, including the survey, Alabama Register, and NRHP files the Alabama Historical Commission in Montgomery, indicates that no previously recorded historic structures were reported within 0.5 miles of the project area. One historic structure was examined in the vicinity of the project, but it was determined not to lie within the APE.

The records search for archaeological resources focusing on Alabama State Site File records determined that no previously recorded archaeological sites had been reported within the project's boundary. Likewise historic maps showed no possible historic archaeological sites within the project boundary (see Chapter III). One archaeological site, 1RU356, is located about 500 feet (148 m) south of the south boundary of the project area. This lithic and ceramic scatter, recorded by Panamerican Consultants in 1996 was tested by TRC's predecessor, Garrow and Associates, in 1996, after which the site was recommended ineligible for the NRHP (Hendrix 1996; Jones 1996). No other previously recorded archaeological sites have been recorded within 1 mile of the study area.

During field investigations, no new archaeological sites were identified within the project area. Two isolated finds, IF1 and IF2, were recorded, however.

ISOLATED FIND 1

One isolated find was encountered in a dirt road that surrounds the project area (see Figure 1). It is a tertiary chert biface fragment. The shoulders are present but the base is gone, therefore making it impossible to type. Surface visibility was 100 percent in this area. No sign of an associated site was observed, and no other artifacts were recovered from adjacent shovel tests or the surface. Because the artifact appears to be out of context and is not associated with other archaeological materials, it was not recorded as an archaeological site, and is not considered eligible for the NRHP.

ISOLATED FIND 2

The other isolated find was encountered on the surface along a shovel test transect (see Figure 1 and Figure 7). It is a single chert flake. Surface visibility was 98 percent in this area. No sign of an associated site was observed, and no other artifacts were recovered from adjacent shovel tests or the surface. Because the artifact appears to represent ephemeral prehistoric activity not connected to a more substantial camp site with associated archaeological materials, it was not recorded as an archaeological site, and is not considered eligible for the NRHP.

VI. SUMMARY AND RECOMMENDATIONS

On July 2–3, 2008, TRC conducted a cultural resources survey for the proposed 50-acre expansion of the Pine Hollow Landfill in Russell County, Alabama. The survey included a Phase I archaeological survey to identify all archaeological sites within the project area, and an historic architectural survey extending into the surrounding viewshed of the proposed facility.

During the field investigations, no new archaeological sites or historic architectural resources were identified within the project's APE. Two isolated finds, IF1 and IF2, were recorded in the tract, however, and recommended not eligible for the NRHP.

Based on the results of this study, TRC recommends no further cultural resource investigations in advance of this project.

REFERENCES

Alabama State Highway Department (ASHD)

1937 General Highway and Transportation Map, Russell County, Alabama. ASHD, in cooperation with the U.S. Department of Agriculture, Bureau of Public Roads.

1950 General Highway Map, Russell County, Alabama. ASHD, in cooperation with the U.S. Department of Commerce, Bureau of Public Roads.

1954 General Highway Map, Russell County, Alabama. ASHD, Division of Highway Planning, in cooperation with the U.S. Department of Commerce, Bureau of Public Roads.

1964 General Highway Map, Russell County, Alabama. ASHD, Division of Highway Planning, in cooperation with the U.S. Department of Commerce, Bureau of Public Roads.

Anderson, David G.

1985 Middle Woodland Societies on the Lower Atlantic Slope: A View from Georgia and South Carolina. *Early Georgia* 13(1, 2):29–66.

Anderson, David G., Charles E. Cantley, and Lisa Novick

1982 *The Mattassee Lake Sites: Archaeological Investigations Along the Lower Santee River in the Coastal Plain of South Carolina.* Special Bulletin 1. Archaeological Services Branch, National Park Service, Atlanta, Georgia.

Anderson, David G., and Glen L. Hanson

1988 Early Archaic Settlement in the Southeastern United States: A Case Study from the Savannah River Valley. *American Antiquity* 53(2):262–286.

Anderson, David G., and Joe W. Joseph

1988 *Prehistory and History Along the Upper Savannah* River. *Technical Synthesis of the Richard B. Russell* Reservoir. 2 vols. Russell Papers. Interagency Archaeological Services, National Park Service, Atlanta.

Anderson, David G., R. Jerald Ledbetter, and Lisa D. O'Steen

1990 *Paleoindian Period Archaeology of Georgia.* Georgia Archaeological Research Design Paper No. 6. University of Georgia, Athens.

Anderson, David G., Lisa O'Steen, and Kenneth Sassaman

1996 Environmental and Chronological Considerations. In *The Paleoindian and Early Archaic Southeast,* edited by David G. Anderson and Kenneth E. Sassaman, pp. 3–15. University of Alabama Press, Tuscaloosa.

Ashley, Keith H.
1993 Swift Creek Traits on the St. Johns River: Ceramics, Mounds, and Middens. Paper presented to LAMAR Institute's Swift Creek Conference, May, 1993, Ocmulgee national Monument, Macon, Georgia.

Bense, Judith A.
1993 Santa Rosa-Swift Creek in Northwest Florida. Paper presented at the LAMAR Institute's Swift Creek Conference, Ocmulgee National Monument, Macon, Georgia.

Benyshek, Tasha, Michael Wild, Larissa A. Thomas, Andrew H. Ivester, Andrea Shea Bishop, and William Stanyard
2003 *Archaeological Data Recovery at 9CL269 and 9CL270, H.C. (Hill) Seaton Reservoir, Carroll County, Georgia.* TRC, Atlanta. Report submitted to the Carroll County Water Authority.

Berney, Saffold
1892 *Hand-Book of Alabama.* Robert and Son, Birmingham.

Bowen, William R.
1982 *Archaeological Investigations at 9Ck(DOT)7 Cherokee County,* Georgia. Occasional papers in Cultural Resource Management 1. Georgia Department of Transportation, Atlanta.

1989 An Examination of Subsistence, Settlement, and Chronology during the Early Woodland Kellogg Phase in the Piedmont Physiographic Province of the Eastern United States. Unpublished PhD. Dissertation, Department of Anthropology, University of Tennessee, Knoxville.

Braley, Chad O.
1991 *Draft report. Archaeological Data Recovery at Yuchi Town, 1Ru63, Fort Benning,* Alabama. Gulf Engineers & Consultants, Inc., Baton Rouge, Louisiana and Southeastern Archaeological Services, Inc., Athens, Georgia. Report submitted to U.S. Army Corps of Engineers, Savannah District.

Braun, E. Lucy
1950 *Deciduous Forests of Eastern North America.* MacMillan, New York.

Bryson, R. A., D. A. Baerreis, and W. M. Wendland
1970 The Character of late Glacial and Post Glacial Climatic Changes. In *Pleistocene and Recent Environments of the Central Great* Plains. W. Dort, Jr. and J. K. Jones, Jr., editors. University of Kansas Special Publications 3, pp. 53–74.

Bullen, Ripley P.
1958 Six Sites Near the Chattahoochee River in the Jim Woodruff Reservoir Area, Florida. River Basin Surveys Papers No. 14. *Bureau of American Ethnology Bulletin* 169. Smithsonian Institution, Washington.

Caldwell, Joseph R.
1955 Investigations at Rood's Landing Stewart County, Georgia. *Early Georgia* 2(1)22–47.

1957 *Survey and Excavations in the Allatoona Reservoir, Northern Georgia.* Manuscript No. 151. On file, Department of Anthropology, University of Georgia, Athens.

1958 *Trend and Tradition in the Prehistory of the Eastern United States*. Memoir 88. American Anthropological Association, Menasha.

Chase, David W.
n.d. Woodland in the Middle Chattahoochee Area. Ms. On file, Columbus Museum of Arts and Science, Columbus, Georgia.

1957 The Halloca Creek Site. Ms. on file, Southeast Archaeological Center, national Park Service, Tallahassee, Florida.

1958 The Averett Site. Ms. on file, Columbus Museum of Arts and Science, Columbus, Georgia.

1959a Middle Chattahoochee Valley. Ms. On file, Columbus Museum of Arts and Science, Columbus, Georgia.

1959b *The Averett Culture.* Paper 1. Coweta Memorial Association, Columbus, Georgia.

1962 Middle Chattahoochee Valley Synthesis. Ms. on file, Columbus Museum of Arts and Science, Columbus, Georgia.

1963a Background of the Archaeology of the Middle Chattahoochee Valley 1955–1963. Ms. On file, Columbus Museum of Arts and Science, Columbus, Georgia.

1963b A Reappraisal of the Averett Complex. *Journal of Alabama Archaeology* 9(2):49–61.

1993 Swift Creek Complicated Stamped: Lineage and Diffusion. Paper presented at LAMAR Institute's Swift Creek Conference, Ocmulgee National Monument, Macon, Georgia.

Coe, Joffre L.
1964 Formative Cultures of the Carolina Piedmont. *Transactions of the American Philosophical Society* 54(5).

Crook, Morgan R., Jr.
1984 *Cagle Site Report, Archaic and Early Woodland Manifestations in the North Georgia Piedmont.* Occasional papers in Cultural Resource Management 2. Georgia Department of Transportation, Atlanta.

1990 *Rae's Creek: A Multicomponent Archaeological Site in the Central Savannah River Valley.* Georgia Department of Transportation, Atlanta.

DeJarnette, David L., Edward B. Kurjack, and James W. Cambron
1962 Stanfield-Worley Bluff Shelter Excavations. *Journal of Alabama Archaeology* 8:1–2.

Delcourt, Hazel R., and Paul A. Delcourt
1985 Quaternary Palynology and Vegetational History of the Southeastern United States. In *Pollen Records of the Late-Quaternary North American Sediments,* edited by V. M. Bryant, Jr., and R. G. Holloway, pp. 1–37. American Association of Stratigraphic Palynologists Foundation.

Delcourt, Paul A.
1978 *Quaternary Vegetation History of the Gulf Coastal Plain.* Unpublished Ph.D. dissertation, Department of Geology and Geophysics, University of Minnesota.

1985 The Influence of Late-Quaternary Climatic and Vegetational Change on Paleohydrology in Unglaciated Eastern North America. *Ecologia Mediterrane* XI(1):17–26.

Delcourt, Paul A., and Hazel R. Delcourt
1983 Late Quaternary Vegetational Dynamics and Community Stability Reconsidered. *Quaternary Research* 19:265–271.

1987 *Long-Term Forest Dynamics of the Temperate Zone: A case Study of Late-Quaternary Forests in Eastern North America.* Ecological Studies 63. Springer-Verlag, New York.

Elliott, Daniel T.
1989 *Falcon Field and Line Creek: Two Archaic and Woodland Period Sites in West Central* Georgia. Southeastern Archaeological Services, Inc., Athens, Georgia. Submitted to Peachtree City Airport Authority, Peachtree City, Georgia and Wilbur Smith Associates, Columbia, South Carolina.

Elliott, Dan T., Jeffrey L. Holland, Phil Thomason, Michael Emrick, and Richard W. Stoops
1995 *Historic Preservation Plan for the Cultural Resources on U.S. Army Installations at Fort Benning's Military Reservation, Chattahoochee and Muscogee Counties, Georgia, and Russell County, Alabama, Volume 2: Technical Synthesis.* Garrow and Associates, Inc. Prepared for the National Park Service.

Elliott, Daniel T., R. Jerald Ledbetter, and Elizabeth A. Gordon
1994 *Data Recovery at Lovers Lane, Phinizy Swamp and the Old Dike Sites Bobby Jones Expressway Extension Corridor, Augusta Georgia.* Occasional Papers in Cultural Resources Management 7. Georgia department of Transportation, Atlanta.

Elliott, Daniel T., and Jack T. Wynn
1991 The Vining Revival: A Late Simple Stamped Phase in the Central Georgia Piedmont. *Early Georgia* 19(1):1–18.

Fish, Suzanne K., and Richard W. Jefferies
1983 The Site Plan at Cold Springs, 9GE10. *Early Georgia* 11(1,2):61–77.

Golley, Frank B.
1962 *Mammals of Georgia: A Study of the Distribution and Functional Role in the Ecosystem.* University of Georgia Press, Athens.

Goodyear, Albert C
2001 The 2001 Allendale Paleoindian Expedition and Beyond. *Legacy Newsletter*, December 2001.

2002 The 2002 Allendale Paleoindian Expedition and Beyond. *Legacy Newsletter*, July 2002.

Gresham, Thomas H., and R. Jerald Ledbetter
1989 Averett Phase at the Mill Creek Site. *LAMAR Briefs* 14:7–8.

Gresham, Thomas H., W. Dean Wood, Chad O. Braley, and Kay G. Wood
1985 *The Carmouche Site: Archaeology in Georgia's Western Fall Line* Hills. Southeastern Archaeological Services, Inc., Athens, Georgia. Report submitted to the U.S. Army Corps of Engineers, Savannah District, Savannah, Georgia.

Gresham, Thomas H., R. Jerald Ledbetter, Robbie F. Ethridge, and T. Jeffrey Price
1989 *Archaeological Investigations of the Mill Creek Site, Americus, Georgia.* Southeastern Archaeological Services, Inc., Athens. Submitted to the City of Americus, Americus, Georgia.

Griffin, John W.
1950 Test Excavations at the Lake Jackson Site. *American Antiquity* 16(2):99–112.

Gunn, Joel D., and Kathy J. Wilson
1993 *Archaeological Data Recovery Investigations at 33CT54 and 38CT58 Along the SC151 Jefferson Bypass, Chesterfield County, South* Carolina. Garrow & Associates, Inc., Raleigh, North Carolina. Submitted to South Carolina Department of Highways and Public Transportation, Columbia, South Carolina.

Hendrix, Greg S.
1996 *An Archaeological Survey and Cultural Resource Inventory of the Proposed Pine Hollow Landfill, Russell County, Alabama.* Panamerican Consultants, Inc., Tuscaloosa. Report submitted to Smith Environmental Technologies Corporation.

Huscher, Harold A.
1964 The Standing Boy Flint Industry, An Early Archaic Manifestation on the Chattahoochee River in Alabama and Georgia. *Southern Indian Studies* 16:3–20.

Jenkins, Ned J.
1978 Prehistoric Chronology of the Lower Chattahoochee Valley: A Preliminary Statement. *Journal of Alabama Archaeology* 24(2): 73–93.

Jones, David C.
1996 *Phase II Archaeological Testing of Site 1RU356, Phenix City, Alabama.* Garrow and Associates, Inc., Atlanta. Report submitted to BCM Engineers, Inc.

Kellar, James H., A.R. Kelly, and Edward V. McMichael
1962 The Mandeville Site in Southwest Georgia. *American Antiquity* 27(3):336–355.

Kelly, Arthur R.
1938 A Preliminary Report on Archaeological Explorations at Macon, Georgia. *Bureau of American Ethnology Bulletin* 119:1–68. Smithsonian Institution, Washington, D. C.

Kennedy, Joseph C. G.
1860a *Population of the United States in 1860; Compiled from the Original Returns of the Eighth Census.* Government Printing Office, Washington, D.C.

1860b *Agriculture of the United States in 1860; Compiled from the Original Returns of the Eighth Census.* Government Printing Office, Washington, D.C.

Knight, Vernon J., Jr., and Tim S. Mistovich
1984 *Walter F. George Lake: Archaeological Survey of Fee Owned lands, Alabama and* Georgia. Report of Investigations 42. Report submitted to the U.S. Army Corps of Engineers, Mobile. Office of Archaeological Research, university of Alabama, University.

Ledbetter, R. Jerald, and Chad O. Braley
1989 *Archaeological and Historical Investigations at Florence Marina State park, Walter F. George Reservoir, Stewart County,* Georgia. 2 vols. Southeastern Archaeological Services, Athens, Georgia. Repot on file, Georgia Department of Natural Resources, Atlanta.

Martin, Paul S.
1984 *Pleistocene Overkill: The Global Model. Quaternary Extinctions: A Prehistoric Revolution.* University of Arizona Press, Tucson.

Mason, James M.
1994 *Soil Survey of Russell County, Alabama.* United States Department of Agriculture.

Milanich, Jerald T., Ann S. Cordell, Vernon J. Knight, Timothy A. Kolher, and Brenda, Siegler-Lavelle
1984 *McKeithen Weeden Island: The Culture of Northern Florida, A.D. 200–900.* Academic Press, Orlando, Florida.

O'Steen, Lisa D., R. J. Ledbetter, D. T. Elliott, and W. Baker
1987 Paleoindian Sites of the Inner Piedmont of Georgia: Observations of Settlement in the Oconee Watershed. *Early Georgia* 13:1–30.

Owen, Thomas McAdory
1978 *History of Alabama and Dictionary of Alabama Biography.* 2 vols. The Reprint Company, Spartanburg, South Carolina. Originally published in 1921.

Russell County Historical Commission (RCHC)
1982 *The History of Russell County, Alabama.* Russell County Historical Commission, Phenix City, Alabama.

Sassaman, Kenneth
1993 *Early Pottery in the* Southeast. *Tradition and Innovation in Cooking* Technology. University of Alabama Press, Tuscaloosa.

Scarry, John
1985 A Proposed Revision of the Fort Walton Ceramic Typology: A Type-Variety System. *The Florida Anthropologist* 38:199–233.

Schnell, Frank T. Jr.
n.d. Chattahoochee Valley Archaeological Archives, Smithsonian Institution Microfilmed Data, Index and 7 Microfilm Reels. Copy on file, Columbus Museum of Arts and Science, Columbus, Georgia.

1975 An Archaeological Survey of Lake Blackshear. *Southeastern Archaeological Conference Bulletin* 19:117-121.

1990a Middle Chattahoochee River Phase Characteristics. In *Lamar Archaeology,* edited by Mark Williams and Gary Shapiro, pp. 76-69. University of Alabama Press, University.

1990b *A Cultural Resource Investigation of Archaeological Site 1Ru59 Fort Benning.* Ms. on file, Columbus Museum of Arts and Science, Columbus, Georgia.

Schnell, Gail S.
1981 A Preliminary Political Model of the Rood Phase. *Southeastern Archaeological Conference Bulletin* 24:23–24.

Smith, Betty A.
1979 The Hopewell Connection in Southwestern Georgia. In *Hopewell Archaeology; The Chillicothe* Conference, edited by D. S. Brose and N'omi Greber pp. 181–187. Kent State University Press, Kent Ohio.

State of Alabama Highway Department
1975 General Highway Map, Russell County, Alabama. State of Alabama Highway Department, Bureau of Planning and Programming, Survey and Mapping Division in cooperation with the U.S. Department of Transportation, Federal Highway Administration.

Stephenson, Keith, Adam King, and Frankie Snow
1991 Excavations at a Middle Mississippian Site in Southern Georgia. *LAMAR Briefs* 18:13–14.

Stoutamire, James W., L. Christine Beditz, Gary D. Knudsen, and Jill S. Palmer
1977 *The Mossy Oak Site (11 Bi 17), Bibb County, Georgia.* National Park Service, Tallahassee, Florida.

Szabo, Michael W.
1988 Geologic Map of Alabama. Geologic Survey of Alabama, Tuscaloosa.

Time Magazine
1962 "As Contagious as Corruption." Published online, *Time Magazine* and CNN, http://www.time.com/time/magazine/article/0,9171,829537,00.html. Originally published 30 Nov. 1962.

U.S. Department of Agriculture (USDA)
1913 Soil Map of Alabama, Russell County Sheet. USDA, Bureau of Soils, Washington, D.C.

U.S. Geological Survey (USGS)
1950 Phenix City, Alabama quadrangle map, 7.5-minute series. USGS, Washington, D.C.

1955 Phenix City, Alabama quadrangle map, 7.5-minute series. USGS, Washington, D.C.

1968 Phenix City, Alabama quadrangle map, 7.5-minute series. Photorevised from 1955 edition. USGS, Washington, D.C.

1973 Phenix City, Alabama quadrangle map, 7.5-minute series. Photorevised from 1955 edition. USGS, Washington, D.C.

Walker, Anne Kendrick
1941 *Backtracking in Barbour County: A Narrative of the Last Alabama Frontier.* The Dietz Press, Richmond, Virginia.

1950 *Russell County in Retrospect.* The Dietz Press, Richmond, Virginia.

Walthall, John A.
1980 *Prehistoric Indians of the Southeast: Archaeology of Alabama and the Middle South.* University of Alabama Press, Tuscaloosa.

Walthall, John A., and Ned J. Jenkins
1976 The Gulf Formational Stage in Southeastern Prehistory. *Southeastern Archaeological Conference Bulletin* 19:43–49.

Watts, W. A.
1971 Postglacial and Interglacial Vegetation History of Southern Georgia and Central Florida. *Ecology* 52:676–690.

1980 Late Quaternary Vegetation History at White Pond on the Inner Coastal Plain of South Carolina. *Quaternary Research* 13:187–199.

Wayne, Lucy B.
1987 Swift Creek Occupation in the Altamaha Delta. *Early Georgia* 15(1,2):46–65.

Whitehead, Donald R.
1973 Late Wisconsin Vegetation Changes in Unglaciated North America. *Quaternary Research* 3:621–631.

Willey, Gordon R.
1949 *Archaeology of the Florida Gulf Coast.* Miscellaneous Collection 113. Smithsonian Institution, Washington, D. C.

Willey, Gordon R., and R. B. Woodbury
1942 A Chronological Outline for the Northwest Florida Coast. *American Antiquity* 7(3):244–246.

Williams, Mark, and Daniel T. Elliott (editors)
1998 *A World Engraved: Archaeology of the Swift Creek Culture.* University of Alabama Press, Tuscaloosa.

Williams, Stephen J. (editor)
1977 *The Waring Papers, The Collected Works of Antonia J. Waring, Jr.* Papers of the Peabody Museum of American Archaeology and Ethnology, Vol. 58. Harvard University, Cambridge.

Wood, W. Dean
1981 *An Analysis of Two Early Woodland Households from the Cane Island Site, 9PM209.* Wallace Reservoir Project Contribution No. 4. Department of Anthropology, University of Georgia, Athens.

Wood, W. Dean, Dan T. Elliott, Teresa P. Rudolph, and Denis B. Blanton
1986 *Prehistory in the Richard B. Russell Reservoir: The Archaic and Woodland Periods of the Upper Savannah River.* Russell Papers. Archaeological Services Branch, National Park Service, Atlanta, Georgia.

Worth, John E., and W. Maxwell Duke
1991 Hogcrawl Creek: Early Mississippian Period Occupation in the Middle Flint River Floodplain. *Early Georgia* 19(1):19–42.

Wynn, Jack T., and Rebecca E. Bruce
1990 Passport: A Pure Vining Phase Site in Central Georgia. *LAMAR Briefs* 16:2–3.

Pine Hollow, Inc.
18 Old Brickyard Road
Phenix City, AL 36869
(334) 297-2140

COLUMBUS BANK AND TRUST COMPANY
PO BOX 120
COLUMBUS, GA 31902
64-60/611

80205

11/3/08

PAY TO THE ORDER OF A DEM $ 1,360.00

ONE THOUSAND THREE HUNDRED SIXTY AND NO/100 DOLLARS

Security Features. Details on back.

MEMO

Lillie C [illegible] MP

⑈080205⑈ ⑆061100606⑆ 22 11 661⑈

FEE SHEET FOR SOLID WASTE PERMITS

ADEM No.: 9656

Applicant: Pine Hollow Inc.

Location: Pine Hollow C/D Landfill
Russell County

Permit No.: 57-07

Date Application Received: 11/04/08

Permit Fees Required	Initial Issuance	Modification	Reissuance	Total
Municipal Solid Waste Landfill	$39,160		$8,700	
Minor Modification [1]		$1,530		
Major Modification [2]		$15,225		
Construction/Demolition Landfill	$3,335		$1,260	
Minor Modification [1]		$680		
Major Modification [2]		$1,360		$1,360
Industrial Landfill	$5,915		$1,905	
Minor Modification [1]		$680		
Major Modification [2]		$2,040		
Medical Waste Transfer Facility	$950	$950	$950	
New Technology Review	$4,765			
Commercial Treatment Facility	$7,685	$7,685	$7,685	
Commercial Transportation of Medical Waste	$1,630	$680	$950	
Storage of Untreated Medical Waste	$1,225	$310	$915	

Additional Fees				
Geological Review:	$2,275	$1,530	$1,530	
Greenfield Site:	$750			
Public Hearing:	$3,945	$3,945	$3,945	
Name Change/Transfer:		$375		
Variance Request	$680	$680	$680	
Compost facility	$1,495	$820		
Solid Waste Disposal Notification	$100	$100	$100	

[1] These are modifications as included in ADEM Admin. Code Rule 335-13-5-.06(2)

[2] These are modifications as included in ADEM Admin. Code Rule 335-13-5-.06(1)

NOV 2008
RECEIVED
ADEM
ENV-DATA-SECT

Total Fee Due:	$1,360
Amount Submitted with Application:	$1,360
Amount Received:	$1,360
Amount to be Billed:	$0
Amount Received:	
Date Received:	
Amount to be Refunded:	

11/19/08

Fee Schedule Prepared by: JDK Date: 11/19/08

Fee Schedule Reviewed by: SSG Date: 11-19-08

2007-1A-0375

8
2

Hatch Mott MacDonald

120 Beckrich Rd
Suite 180
Panama City Beach, FL 32407
T 850.236.5831 www.hatchmott.com

AAC000035 EB0000155 LB00006783 LC26000216

RECEIVED MAR 2009 DAPHNE FIELD OFFICE

March 9, 2009

Post-it® Fax Note 7671 | Date 3/16/09 | # of pages ▶ 1
To J. M. Bundy | FROM: Sandy M
Co./Dept. H. M. MacDonald | Co.: USFWS
Phone # | Phone #: 251-441-5184
Fax # 850-234-1952 | Fax#: 251-441-6222

Mr. Bill Pearson
Field Supervisor
U.S. Fish and Wildlife
1208 B Main Street
Daphne, AL 36526

Re: Pine Hollow Landfill Expansion
HMM Project No. 237654CE01

Dear Mr. Pearson:

Attached for you review and approval is the Wetlands and Listed Species Survey Report by Frasier O. Bingham, Ph.D. for the 2nd expansion of the Pine Hollow, Inc. Landfill in Russell County, Alabama. The survey report states the entire area over the past few years has been clear-cut for timber and cleared, and no jurisdictional wetlands or listed species were noted.

The application for expansion of the landfill has been submitted to the Alabama Department of Environmental Management (ADEM) for approval. The only outstanding item needed for approval by ADEM is a letter from the U.S. Fish and Wildlife Service stating there are no federally listed species proposed on the project site.

The following items are attached for your use:

1) Wetland and Listed Species Survey Report *by Frasier O. Bingham, Ph.D.*
2) Site Data (Section 3) from the ADEM application.
3) U.S. Fish and Wildlife letter and survey for Threatened or Endangered Species *by Frasier O. Bingham, Ph.D. (1996)* for the first expansion.

We appreciate your time in reviewing this submittal. Should you have any questions please feel free to call.

Sincerely,

Hatch Mott MacDonald

James M. Bundy, P.E.
Vice President

VB

U.S. Fish and Wildlife Service
1208-B – Daphne, Alabama 36526
Phone: 251-441-5181 Fax: 251-441-6222

Based upon our records and the information provided in your letter, we agree with your findings that no federally listed species/critical habitat occur in the project area. **If project design changes are made, please submit new plans for review.**

3/16/09

William J. Pearson, Field Supervisor Date #6

Acting for

cc: Mr. Craig Reaves, Reaves Wrecking Co., Inc.

Hatch Mott MacDonald

120 Beckrich Rd
Suite 180
Panama City Beach, FL 32407
T 850.236.5831 www.hatchmott.com

AAC000035 EB0000155 LB00006783 LC26000216

March 12, 2009

Mr. Rao Malladi
ADEM
1400 Colliseum Blvd.
Montgomery, Alabama 36110

Re: Pine Hollow Landfill Expansion
HMM Project No. 237654CE01

Dear Mr. Malladi:

Enclosed is a copy of the grading plan and cross-sections showing 10 foot separation between the groundwater and the bottom of the disposal area. Also enclosed is the correspondence from the US Fish and Wildlife Services stating they are in agreement that no federally listed species/critical habitat occurred on the project site.

Should you have any questions, please call.

Sincerely,

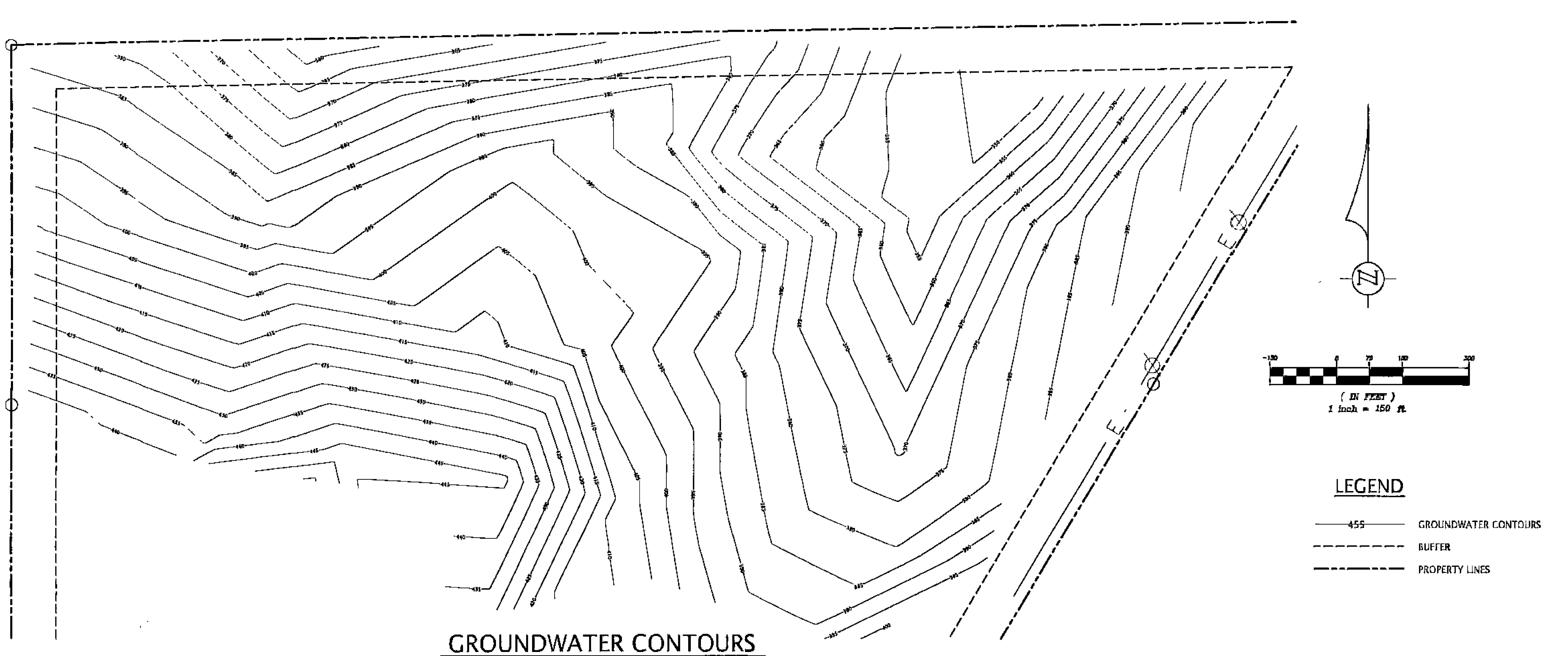
Hatch Mott MacDonald, Florida LLC

James M. Bundy, P.E.
Vice President

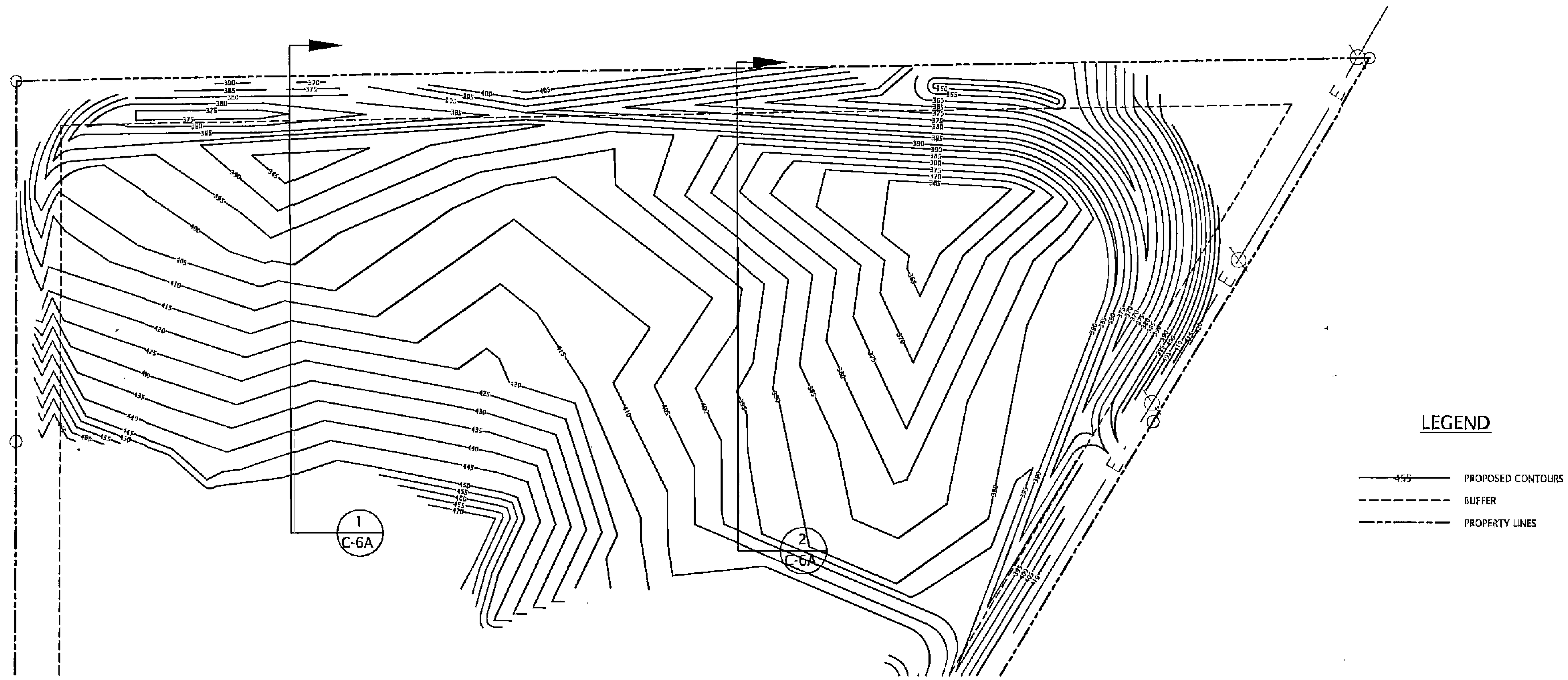
JMB/kh

cc w/attachments: Mr. Craig Reaves, Reaves Wrecking

P:\237654CE01 Reaves - Pine Hollow Landfill\Documents\RMalladi grading plan Cvr Ltr 03-12-09.doc



GROUNDWATER CONTOURS



BOTTOM CONTOURS

PERMIT SUBMITTAL

Hatch Mott MacDonald
Hatch Mott MacDonald Florida, LLC
Architects Engineers Surveyors
AA - C0000035 EB - 0000155 LB - 0006763
120 Beckrich Rd., Suite 300
Panama City Beach, Florida 32407
Telephone: (850) 236-8801 • Fax: (850) 234-1952

PINE HOLLOW INC.
PINE HOLLOW LANDFILL
EXPANSION
PHENIX CITY, ALABAMA

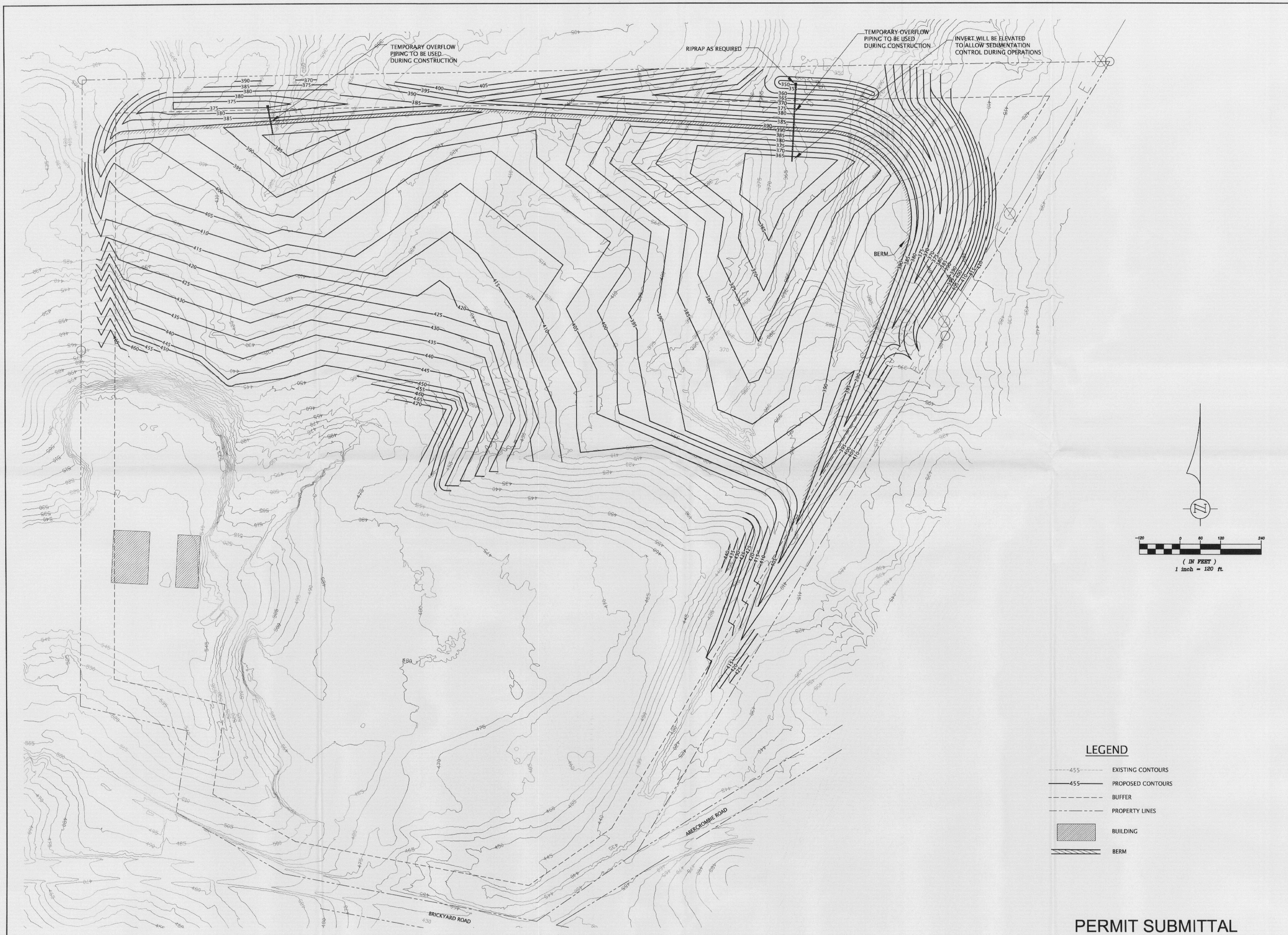
DATE	REV.	REVISION DESCRIPTION
	1	REVISED BOTTOM CONTOURS, NOTED SECTION CUTS

DATE:	MAY 2008
DESIGNED BY:	C. ELKINS
DRAWN BY:	C. ELKINS
PROJECT ENGINEER	J. BUNDY
PROJECT MANAGER:	J. BUNDY
H.M.M. PROJECT NUMBER:	237654

JAMES M. BUNDY, P.E.
ALABAMA CERTIFICATION NO. 18606
6/30/08
DATE
AFFIX SEAL

SHEET TITLE:
EXPANSION AREA GROUNDWATER & PROPOSED BOTTOM CONTOURS

SHEET NUMBER:
C-4



PERMIT SUBMITTAL

Hatch Mott MacDonald
Hatch Mott MacDonald Florida, LLC

Architects Engineers Surveyors
AA - C0000035 EB - 0000155 LB - 0007833
120 Beckrich Rd., Suite 180
Panama City Beach, Florida 32407
Telephone: (850) 236-5831 ¤ Fax: (850) 234-1952

PINE HOLLOW INC.
PINE HOLLOW LANDFILL
EXPANSION

PHENIX CITY, ALABAMA

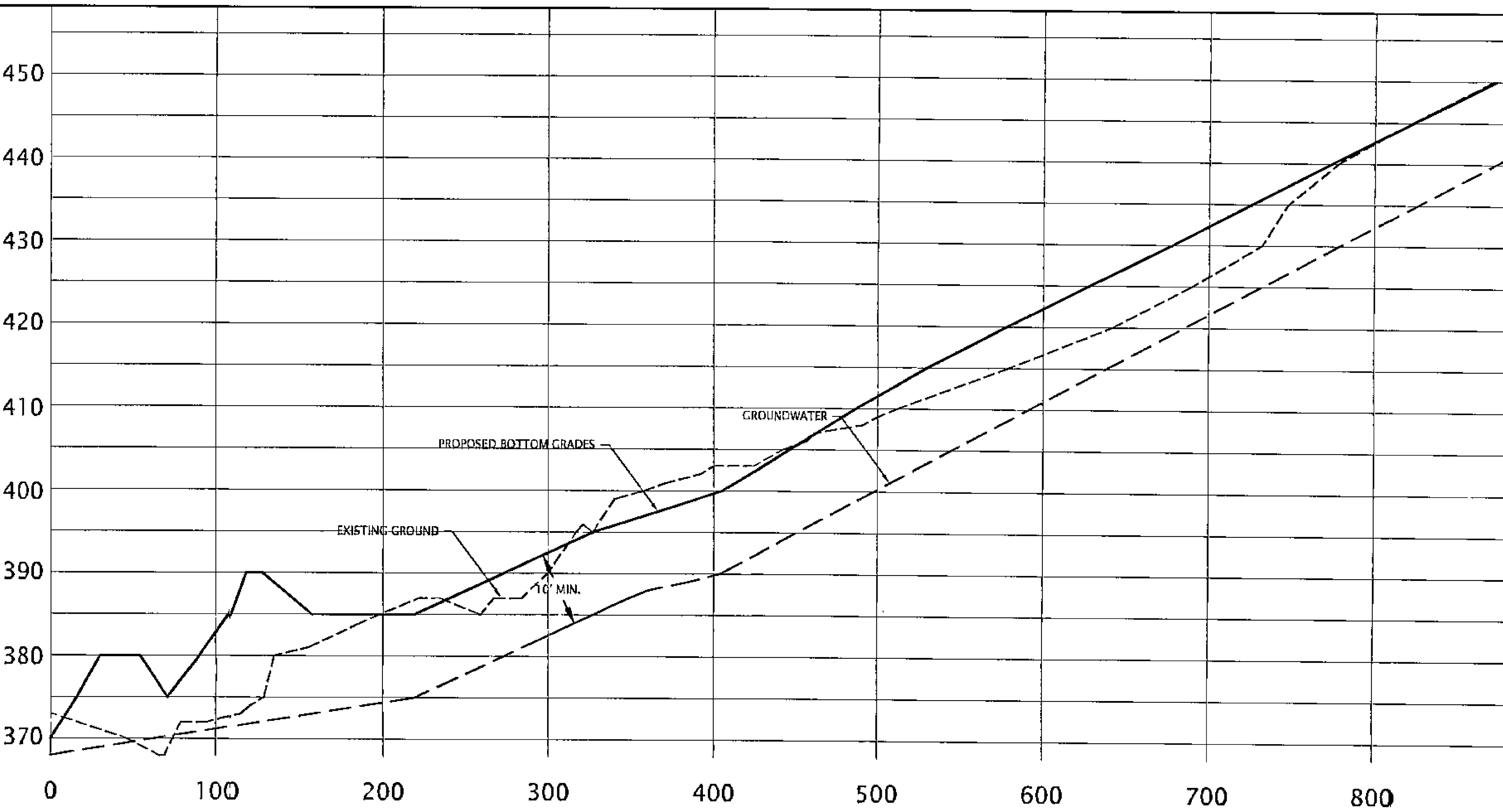
DATE	REV.	REVISION DESCRIPTION
	1	REVISED BOTTOM CONTOURS

DATE:	MAY 2008
DESIGNED BY:	C. ELKINS
DRAWN BY:	C. ELKINS
PROJECT ENGINEER	J. BUNDY
PROJECT MANAGER:	J. BUNDY
H.M.M. PROJECT NUMBER:	237654

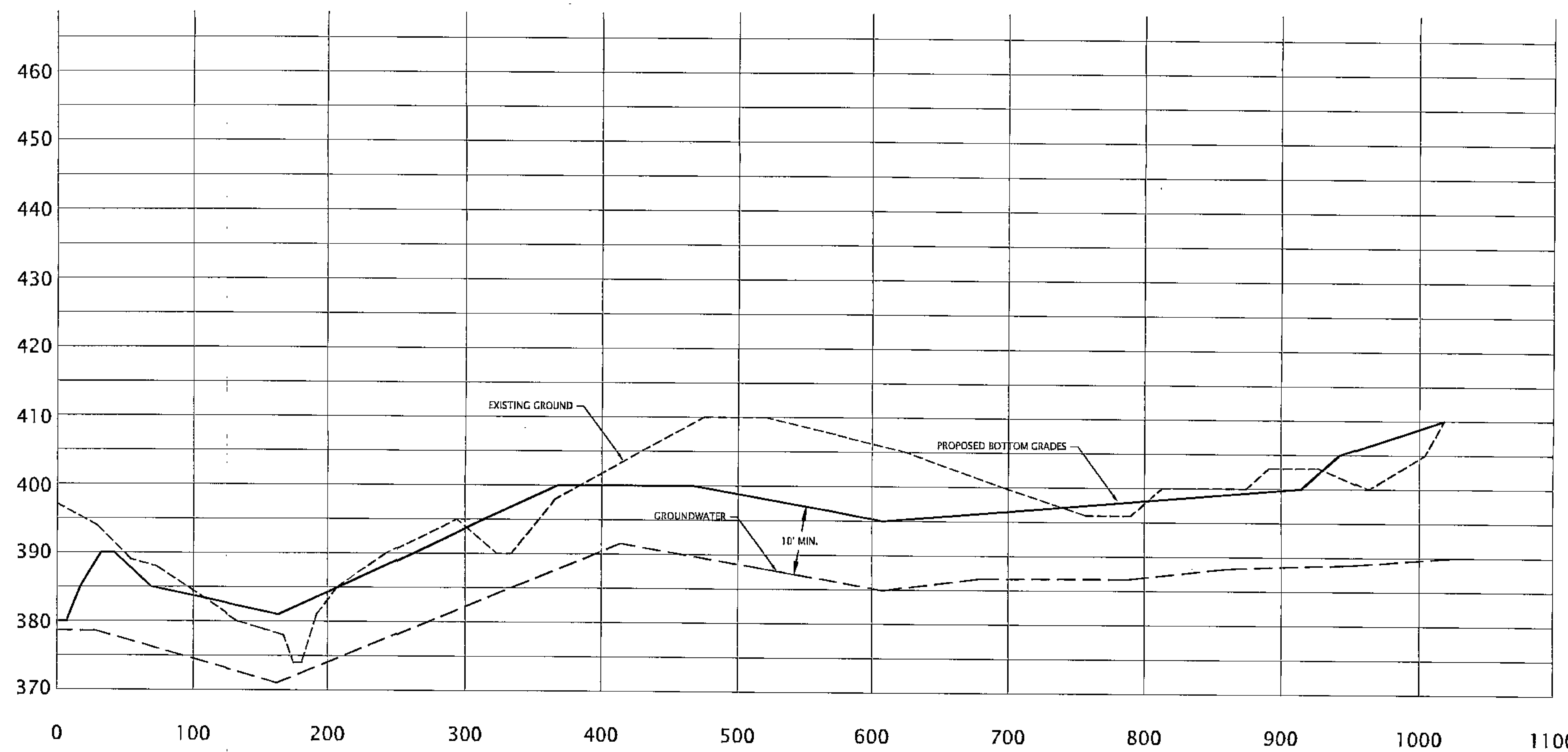
JAMES M. BUNDY, P.E.
ALABAMA CERTIFICATION NO. 18606
10/30/08
DATE
AFFIX SEAL

SHEET TITLE:
DISPOSAL AREA GRADING PLAN

SHEET NUMBER:
C-5



SECTION 1 / C-4



SECTION 2 / C-4

PERMIT SUBMITTAL

Hatch Mott MacDonald
Hatch Mott MacDonald Florida, LLC
Architects Engineers Surveyors

PINE HOLLOW INC.
PINE HOLLOW LANDFILL
EXPANSION
PHENIX CITY, ALABAMA

DATE	REV.	REVISION DESCRIPTION
	1	NEW SHEET

DATE: MAY 2008
DESIGNED BY: C. ELKINS
DRAWN BY: C. ELKINS
PROJECT ENGINEER: J. BUNDY
PROJECT MANAGER: J. BUNDY
H.M.M. PROJECT NUMBER: 237054

JAMES M. BUNDY, P.E.
ALABAMA CERTIFICATION NO. 18505
DATE
AFFIX SEAL

SHEET TITLE:
LANDFILL SECTIONS

SHEET NUMBER:
C-6A


PLAN
SCALE 1" = 50'
PROFILE
SCALE: 1" = 50' HOR.
1" = 5' VERT.
SECTION THROUGH PIPE JOINT AT
℄ OF SUBAQUEOUS HARNESS
No Scale
PIPE SUPPORT
NO SCALE
60" ϕ CONCRETE PIPE PLANT OUTFALL
℄ EXISTING 24" ϕ PIPE
CHLORINE CONTACT BASINS
FIELD MAINTENANCE SHOP BLDG.
FIELD OFFICE
EXISTING 16" ϕ FORCE MAIN
EXISTING 36" SEWER
N 01° 03' E 1132.65'
N 88° 57' W 400.76'
DIFFUSER
EXISTING GROUND
INV. EL. 533.0
INV. EL. 552.8
Anchor Socket
Lug Casting
Draw Bolt
Anchorage Assembly
Circumferential Reinforcement
Steel Cylinder
Steel Spigot Ring
Steel Bell Ring
Rubber Gasket
Creep
Joint Depth
Longitudinal Reinforcement
W10x60 Columns
DECATUR, ALABAMA
MUNICIPAL UTILITIES BOARD
DRY BRANCH
WASTEWATER TREATMENT PLANT
PLANT OUTFALL
DESIGNED WFH
DRAWN CDL.
SCALE NOTED
DATE AUGUST, 1978
PAUL B. KREBS & ASSOCIATES
INCORPORATED
CONSULTING ENGINEERS
BIRMINGHAM, ALABAMA
SHEET 22 OF 268 JOB NO. 546 B
K+E PLATE 1, PLAN-PROFILE
KEUFFEL & ESSER CO.
46 7008 MADE IN U.S.A.